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STRAITS SETTLEMENTS

ANNUAL REPORT

ON THE

MEDICAL DEPARTMENT

FOR THE YEAR

1926

18 APR

BY

A. L. HOOPS, M.D., D.P.H.,

Principal Civil Medical Officer, Straits Settlements.

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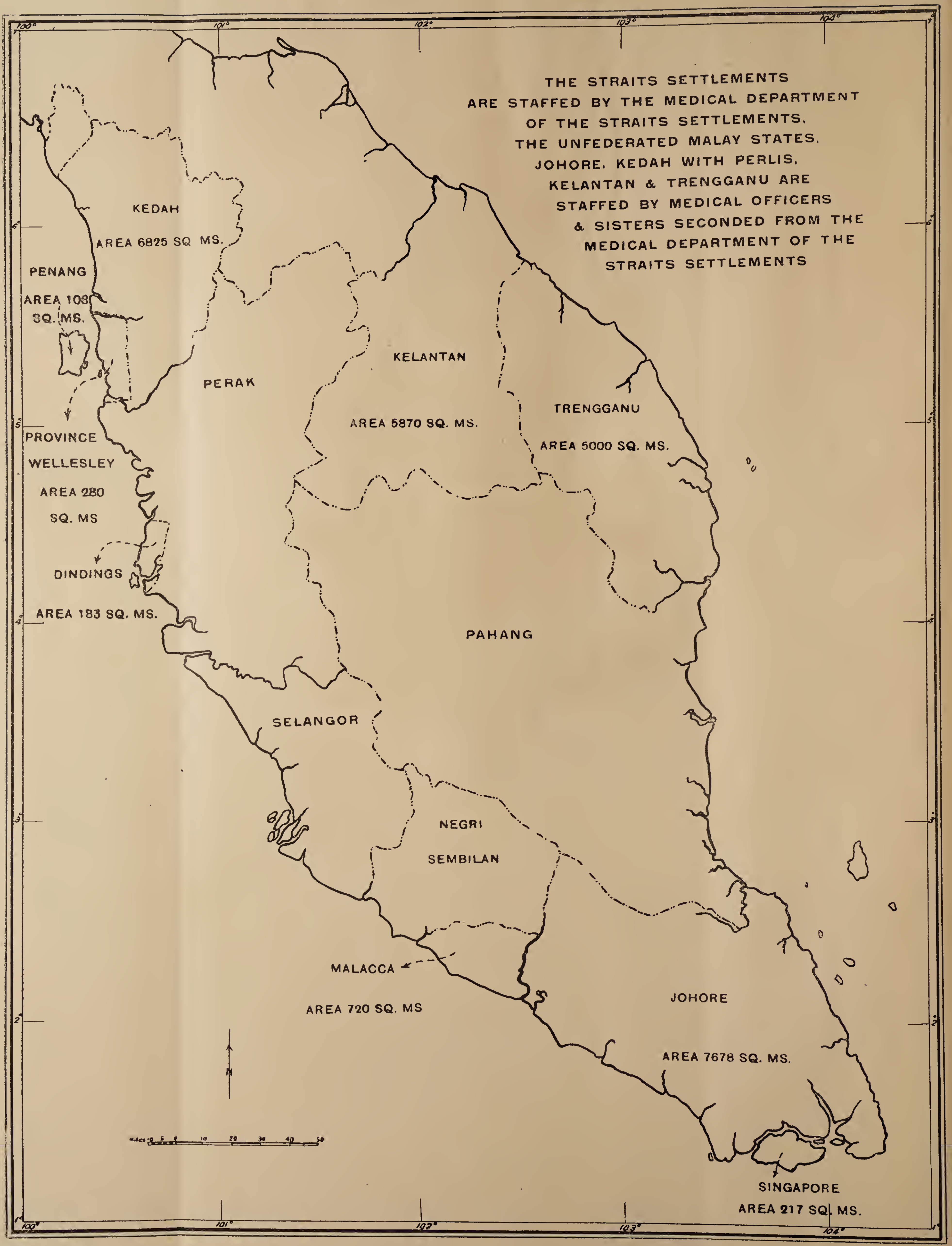


THE STRAITS SETTLEMENTS
ARE STAFFED BY THE MEDICAL DEPARTMENT
OF THE STRAITS SETTLEMENTS.
THE UNFEDERATED MALAY STATES.
JOHORE. KEDAH WITH PERLIS,
KELANTAN & TRENGGANU ARE
STAFFED BY MEDICAL OFFICERS
& SISTERS SECONDED FROM THE
MEDICAL DEPARTMENT OF THE
STRAITS SETTLEMENTS

18 APR.

The Straits Settlements Medical Report for the year 1926

I.—ADMINISTRATION

(*a*) STAFF

The authorised European Staff for 1926 was 126.

2. The following officers were promoted to posts above the time-scale during the year.

Name	*Previous Post*	*Appointment*	*Date*
Dr. A. N. Kingsbury	Pathologist, Institute of Medical Research, Kuala Lumpur	Professor of Bacteriology, College of Medicine, Singapore	30-4-1926
Dr. J. Tull	Pathologist, Penang	Government Pathologist, Singapore	11-8-1926
Mr. J. W. Adams	Time-scale Medical Officer, S. S.	Senior Surgeon, Penang	27-8-1926
Capt. K. B. Williamson	Malaria Research Officer, F. M. S.	Professor of Biology, College of Medicine, Singapore	24-9-1926
Mr. A. D. Wright	Time-scale Medical Officer, S. S.	Professor of Clinical Surgery, College of Medicine, Singapore	1-10-1926

3. Dr. J. A. Cowan, Bacteriologist, Singapore, was appointed Pathologist, Penang, on 11th August, 1926.

4.—(*a*) The following medical officers were appointed to the service after passing through the London School of Tropical Medicine.

Name	*Date of Arrival*
Dr. E. E. Claxton ...	8th April, 1926
Dr. A. S. M. Douglas ...	10th April, 1926
Dr. J. J. Keevil ...	10th April, 1926
Dr. D. Archibald ...	12th August, 1926
Dr. J. A. W. Ebden ...	7th October, 1926
Dr. D. I. Gracey ...	7th December, 1926

(*b*) Dr. W. M. Lupton (late Indian Medical Service) was engaged locally as a medical officer for temporary duty on 3rd July, 1926.

5. The following officers proceeded on leave during the year.

Name	*Appointment*	*Date*
Mr. C. J. Smith ...	Senior Surgeon, Singapore	26th February, 1926
Dr. J. S. English ...	Professor of Midwifery, College of Medicine, Singapore ...	26th February, 1926
Dr. F. R. Sayers ...	Senior Health Officer, Penang	21st March, 1926
Dr. J. G. Harrower	Professor of Anatomy, College of Medicine, Singapore ...	13th April, 1926
Dr. W. A. Taylor ...	Chief Medical Officer, Penang	25th April, 1926
Dr. J. R. Kay-Mouat	Professor of Physiology, College of Medicine, Singapore ...	28th April, 1926
Dr. J. Portelli ...	Time-scale Medical Officer, S. S. ...	29th April, 1926
Dr. R. B. Hawes ...	Time-scale Medical Officer, S. S. ...	20th June, 1926
Mr. M. Jamieson ...	Assistant Analyst, Singapore ...	2nd July, 1926
Dr. L. W. Evans ...	Residency Surgeon, Kelantan ...	13th August, 1926
Dr. J. Gray ..	Chief Medical Officer, Singapore ...	5th October, 1926
Dr. G. H. Macalister	Principal, College of Medicine, Singapore	19th November, 1926
Dr. G. E. Brooke ...	Chief Health Officer, Singapore ...	19th November, 1926
Mr. A. D. Wright ...	Professor of Clinical Surgery, College of Medicine, Singapore	19th November, 1926

6. The following officers returned from leave during the year.

Name	*Appointment*	*Date*
Mr. H. L. Hosking ...	Financial Officer, Medical Department, S. S.	26th January, 1926
Mr. K. Black ...	Professor of Surgery, College of Medicine, Singapore ...	29th January, 1926
Dr. (Mrs.) S. Winstedt	Lady Medical Officer, Singapore ...	25th February, 1926
Dr. W. M. Chambers	Time-scale Medical Officer, S. S.	27th February, 1926
Dr. E. R. Stone ...	Medical Superintendent, Lunatic Asylum, Singapore ...	10th April, 1926
Dr. J. S. Webster ...	Radiologist, S. S. ...	3rd July, 1926
Mr. C. J. Smith ...	Senior Surgeon, Singapore	31st July, 1926
Dr. (Mrs.) L. S. O'May	Lady Medical Officer, Penang	14th August, 1926

Name	*Appointment*	*Date*
—	—	—
Dr. W A. Taylor .	Chief Medical Officer, Penang	22nd October, 1926
Dr. J. R. Kay Mouat	Professor of Physiology, College of Medicine, Singapore ...	25th October, 1926
Dr. F. R. Sayers ..	Senior Health Officer, Penang	18th November, 1926

7. The following officers retired on pension during the year.

Name	*Appointment*	*Date*
—	—	—
Dr. A. L Murison ...	Time-scale Medical Officer, S. S. ...	4th May, 1926
Dr. G. A. Finlayson	Government Pathologist, Singapore ...	11th August, 1926

Dr. R. B. Wallace, Health Officer, resigned on 30th September, 1926. The services of Dr. E. C. Downer were dispensed with on 7th November, 1926.

8. The following officers were seconded for service in the Unfederated Malay States during the year.

Name	*To*	*Date*
—	—	—
Dr. J. I. Baeza ...	Kedah as Health Officer	14th March, 1926
Dr. J. S. E. Manley..	Kedah as Medical Officer	29th April, 1926
Dr. W. M. Lupton ...	Kedah as Medical Officer	26th July, 1926
Dr. J. H. Bowyer ...	Kelantan as Acting Residency Surgeon ...	7th August, 1926

9. *European Matrons and Sisters.*—The death of Miss Elizabeth Fletcher, Matron, General Hospital, Singapore, which occured suddenly on 20th November, 1926, after eighteen years' able and faithful service, is an irreparable loss. Her post had just been made a super-scale one, on account of the increased work and responsibility it involved.

The completion of further wards in the New General Hospital, Singapore, necessitated an increase of five in the number of Nursing Sisters. Similar increases will be needed in 1927 and 1928.

A new post of Matron Grade II, Tan Tock Seng's Hospital, Singapore, was created: the nursing there, which was formerly carried out by dressers without female supervision, has since improved considerably.

10. The local Medical Service numbered 56, mostly graduates of the King Edward VII College of Medicine, Singapore, the Diploma of which entitles the holder to registration in the Colonial List of the General Medical Council of Great Britain.

Eight of these officers successfully filled specialist or prize posts (4 Hospitals and Dispensaries, 3 Health and 1 Leper Asylum) involving duties which in the past would have been performed mainly by Europeans.

11. Colonel R. A. Needham, I.M.S., C.I.E., travelling inspector of the General Medical Council of Great Britain, inspected the College of Medicine, Singapore, and the Hospitals and Health Institutions where instruction is given to medical students, in December.

Though his official report has not yet arrived, Colonel NEEDHAM expressed his satisfaction at the standard of, and facilities for, medical education in Singapore.

12. Sir RONALD ROSS, K.C.M.G., etc., visited Singapore in December and inspected the anti-malarial works carried out by the Government and the Municipality on the Island, and at the new Gunong Pulai Waterworks in Johore, (which will add to the Singapore water supply). He also saw the anti-malarial work of the naval medical officers at the naval base.

Sir RONALD ROSS was much gratified at the important developments based on his original discoveries. His visit has given encouragement to public health workers in Malaya.

13. The year 1926 is rendered notable by two landmarks in the medical history of Singapore.

The first is the opening of the new building of the King Edward VII College of Medicine, Singapore, by the College Patron His Excellency the Governor on February 15th, 1926.

The foundation stone of this building was laid by Lady GUILLEMARD on 6th September, 1923, during the meeting of the Fifth Congress of the Far Eastern Association of Tropical Medicine in Singapore.

The new building is in three storeys of reinforced concrete. The design of the exterior is impressive, special architectural features being the Doric Colonnade on the principal facade and the relief sculpture surrounding the central doorway. To right and left of the main facade, the walls carry sculptured groups in bas relief. These groups are of classical design and show allegorical representations of the teaching and practice of medicine and surgery. The sculptures were executed by Signor R. NOLLI of Singapore.

Over the subsidiary doors on the main front, there appear the names of the various sciences ancillary to medicines: Chemistry, Physics, Pharmacology, Surgery, Biology and so on.

On the ground floor, the central block contains the College Council Chamber and administrative offices. The museum is situated at the back of this storey. In the right and left wings are laboratories for biochemistry and pharmacy and smaller research rooms.

The first floor contains in its central block, lecture rooms and private rooms, and a room for the department of hygiene. The left wing is occupied by the departments of pathology and bacteriology, the right wing by the departments of chemistry and physics. Over the museum is the main lecture hall.

The centre of the second floor is occupied by the library, a room measuring 80 by 26 feet, with librarian's room and students' reading room communicating. The left wing is occupied by the physiological, the right by the biological department.

The whole of the new building has been planned to provide ample accommodation not merely for the ordinary undergraduate classes but also for advanced study and research. And the various departments are being so equipped, that every requirement for the investigator will be available.

The various laboratories, lecture rooms and offices have been constructed on a modified convertible unit system, so that with trifling structural alterations, any room can be adapted for any required purpose. If, as the College develops, it is found that more laboratory space is needed, this can be provided by encroaching upon the office accommodation or by converting a lecture room. The School of Anatomy has been adequately housed in the old administration block of the College.

The new building was designed by Major P. H. KEYES, D.S.O., who also designed the New General Hospital and the New Post Office.

After the opening Ceremony, His Excellency the Governor ascended to the great main lecture hall of the College, which holds 500 persons, and, in the presence of a large and enthusiatic audience, conferred the honorary Diploma of the College on three distinguished medical men.

Sir David Galloway, M.D., F.R.C.P., (Edinburgh) Member of the Executive Council of the Colony, and for many years lecturer on the practice of physic in the College of Medicine;

Dr. Lim Boon Keng, M.D., (Edinburgh), L.L.D., (Hongkong), O.B.E., lately a Member of the Legislative Council of the Colony, for several years a lecturer on materia medica and therapeutics in the College, and now President of Amoy University, and Sir Malcolm Watson, M.D., L.L.D., (Glasgow), D.P.H., (Cantab), of Klang, Federated Malay States, universally known as an original worker, writer and consultant on Malaria and its prevention.

The second landmark is the opening of the New General Hospital, Singapore, by His Excellency the Governor on 29th March, 1926.

The new General Hospital contains 800 beds of which over 500 were occupied at the date of the opening.

It is built in three separate units.—

(*a*) The first and second class male wards and first class female wards with the main administration block;

(*b*) The second and third class female wards; and

(*c*) The third class male wards with a sub-administration block.

The pavilion type of ward has been adopted throughout—the main feature being a long central corridor with wards at right angles on each side.

An admission and casualty room and a dispensary and the offices and stores are in the main administration block. On the second and third floors are flats accommodating six of the medical staff.

The operating theatres and the suites for the surgeons (including eye and ear, nose and throat) and for the radiologist, are on one side of the main corridor behind the administration block, while the sterilisers and the first class kitchens balance the theatres on the other side. Behind this again come in succession three blocks of pavilion wards one of which has a third storey for the reception of tuberculosis cases.

This unit holds 200 patients. All the floors are covered with rubber sheeting.

The two second and third female blocks, each of three floors accommodating 170, including a children's ward of 36 beds, are situated between the first class unit and the third class male unit.

The Pathological Laboratory lies behind the female wards and behind it again, near the main road at the back of the Hospital, is the Mortuary.

The third class male unit consists of five sets of pavilions accommodating nearly 400 patients.

The admission block in this unit contains the sub-administration offices, dispensary, a venereal clinic, the third class operation theatres and the admission wards. There are separate kitchens for Mohamedans, Chinese, Sikhs and Bengalis. There is a system of lifts in every pavilion in the hospital.

All the sanitary blocks are cut off from the main blocks by ventilating lobbies.

The hospital has its own electric power plant, and its own telephone exchange.

Over one hundred sisters, staff nurses and probationers are accommodated in the Nurses Quarters.

There are attendants' quarters for a menial staff of 200.

The only parts of the Hospital still uncompleted are the out-patient block which is to be beside the gate of the main entrance, and the isolation block for refractory and observation cases.

(*b*) THE FOLLOWING ORDINANCES AFFECTING PUBLIC HEALTH WERE ENACTED DURING THE YEAR

1. An Ordinance to amend Ordinance No. 157 (Quarantine and Prevention of Disease).

The amendment provides—

(1) For the revaccination of all children within six months of their attaining the age of seven years, and

(2) That on the declaration by the Colonial Secretary or a Resident, on the recommendation of the Principal Civil Medical Officer, Straits Settlements, that an epidemic exists in any district or area in the Colony in which an outbreak of small-pox may occur, every person living in such district or area who has not had small-pox, or has not been successfully vaccinated the previous five years, shall forthwith be vaccinated free of charge.

2. An Ordinance to amend Ordinance No. 139 (Sale of Food and Drugs).

Under the original Ordinance the importation of skimmed or separated milk into the Colony was an offence; the amendment provides that such milk may be imported in accordance with the provision of a licence issued by the Colonial Secretary, the object being to permit the importation of skimmed milk powder by firms licensed to use such powder in the manufacture of reconstituted whole milk of good quality.

3. An Ordinance to amend Ordinance No. 119 (Hospitals Board) by the addition of the Chief Medical Officer, Singapore, to the Board.

(*c*) FINANCIAL

The actual medical and sanitary expenditure and the revenue collected in the various settlements were:—

1926

Expenditure

	$	c.
Singapore	2,140,832	14
Penang	881,842	92
Malacca	283,096	28
Labuan	18,845	53
Total ...	3,324,616	87

1926

REVENUE

	$	c.	
Singapore	383,471	27	
Penang	276,824	23	including payments for lepers.
Malacca	21,820	33	
Labuan	2,342	84	
Total ...	684,458	67	

Of the expenditure $616,305.58 was spent on the Health Branch and $122,448·13 on the College of Medicine, Singapore.

It is to be remembered that in addition to the above, the Health Services of the Municipalities spent:—

	$	c.
Singapore	822,659	70
Penang	139,176	10
Malacca	19,470	11
Total ...	981,305	91

The total revenue of the Colony was $35,090,044.

Further particulars are given in Table *II*.

II.—PUBLIC HEALTH

General Remarks:—

The year was, not only in the Straits Settlements but generally throughout Malaya, the most unhealthy experienced since the Influenza Pandemic occurred in 1918. During the last quarter of 1925, there had been a definite increase in the incidence of Malaria and Pulmonary diseases. This increase persisted in January, February and March, almost invariably the coolest and the healthiest months in the year, but which in 1926 experienced an unusually low rainfall. With the continuance of very hot and dry weather in April the death-rate from Malaria and Pneumonia, and the Infantile Mortality rose to altogether abnormal heights, diminished only when better rains and cooler weather were experienced in September and October, but still remained above normal during the last quarter of the year.

It is to be remembered that the immigration from China which in 1925 totalled 214,692, reached the record figure of 348,593 in 1926, while only 123,308 Chinese deck passengers returned to China. What proportion of the excess remained in the Straits Settlements is not known, but it was doubtless sufficient to make our death returns inaccurate.

The net increase in the Southern Indian population of Malaya was over 100,000, mainly assisted immigrants.

It is worth while to quote in full the monthly mortality figures for the past three years—1924 an entirely normal and healthy year—1925, the healthiest year on record, though marred by an unusual mortality in the last quarter, and 1926 unhealthy throughout but especially so during the five months April to September.

Year	*1924*	*1925*	*1926*
January	2,165	2,054	2,579
February	2,000	1,857	2,141
March	2,020	1,991	2,458
April	2,063	2,099	2,762
May	2,318	2,457	3,340
June	2,267	2,245	3,227
July	2,408	2,208	3,038
August	2,376	2,298	2,740
September	2,269	2,332	2,504
October	2,189	2,514	2,588
November	2,113	2,463	2,534
December	2,170	2,588	2,722
Total Deaths	26,358	27,106	32,633
Estimated Population	960,952	994,266	1,025,835
Death-rate per thousand	27·42	27·26	31·81

The rainfall figures have an important bearing on the rise in the death-rate.

In Singapore the rainfall was distinctly below the average. 2.172 millimetres against 2,959 millimetres for the previous year, and it was also unevenly distributed.

In the first half year there were only 803 millimetres against 1.498 millimetres in the first half of the previous year, which is normal. In Penang though the rainfall was 2,967 millimetres, for the first half year it was only 607 millimetres, against 1,572 millimetres during the same period in 1925.

In Malacca the rainfall was also low, 2,409 millimetres for the year, of which only 938 millimetres fell in the first six months against 1,092 in 1925. In fact the first half of the year was everywhere much drier than the average. In consequence many anopheline breeding grounds from which the larvæ would usually be washed out by rainfall before maturity, went unflushed, with a resultant increase in dangerous mosquitoes and in malarial infection. The great increase of Anopheles Ludlowi, the brackish water breeder, in all the tidal swamps during the dry months, created a menace impossible to deal with adequately. More permanent measures have in the past been taken against Anopheles Maculatus the prime cause of Malaria arising from ravines and hilly land, and the damage done by this pest was proportionately less than by Anopheles Ludlowi.

Minor causes which helped to increase the death-rate, were the large amount of building and of opening of new agricultural land all over the country which always tend to produce new seepage areas, and the tremendous influx of new labour.

The first half of the year 1911 approached the first half of the year 1926 in dryness. The death-rate in 1911 was 46·46 per thousand for the year, a record which has been unequalled even in the Influenza year 1918. The deaths from Malaria and Fever Unspecified in 1911 were 5,821 and 4,825—total 10,646. It is certain that but for the anti-mosquito measures which were commenced in 1912 and which have been carried out with increased intensity since 1921, the death-rate in 1926 would have been much greater. There was some increase in deaths from Bowel diseases as is usual in a dry year and there was a great increase in mortality from the Pneumonias, which I attribute to the effects of heat and overcrowding.

Infantile mortality was naturally up. Incidentally there were more premature births.

GENERAL DISEASES

(1) *Beri-beri.*—The deaths registered as due to Beri-beri in the last 16 years are:—

Year	*Number of deaths*	*Year*	*Number of deaths*
1911 (Census) (714,069)	2,056	1919	1,430
1912	1,926	1920	1,025
1913	1,657	1921 (Census) (881,939)	1,299
1914	1,483	1922	1,388
1915	1,079	1923	904
1916	1,075	1924	910
1917	2,075	1925	973
1918	1,958	1926	1,098

The estimated population for the year 1926 was 1,025,834:—

Food rationing leading to a decrease in the use of overmilled rice was in practice from 1918 to 1921. The continuance of lower figures is perhaps due to the effect of better education, though prosperity occasionally leads to this disease in individuals who indulge a too exclusive taste for the more expensive overmilled rice.

(2) *The Pneumonias.*—Deaths under this head numbered 2,807 against 2,214 in 1925 and 1,838 in 1924. Of these roughly one-third (934) including a number of children were classed as Broncho-pneumonia, and two-thirds (1,873) as Pneumonia.

In the Straits Settlements these diseases are largely due to over-crowding.

One thousand eight hundred and forty-three of the deaths occurred within Singapore Municipality against 1,481 in 1925, while Penang Municipality contributed 349 deaths to the total, compared with 276 in 1925.

(3) *Convulsions.*—This indefinite heading is an index to the infantile mortality; it will always continue to bulk large in the returns as long as only about one-third of the population dying are seen by qualified medical practitioners before death.

It covers many deaths due to Dietetic errors and some due to Malaria and to Tetanus. No less than 4,783 deaths were so registered in 1926 as against 3,890 in 1925 and 3,832 in 1924.

INFECTIOUS DISEASES

(*a*) The deaths from Plague, 7, all in Singapore City, were the lowest for 10 years: the number in 1925 was 59. The decrease is doubtless due to the unusual heat.

No plague infected rats were found during the year. Five thousand two hundred and forty-one rats were examined by the Singapore Municipal Bacteriologist since 1923; the fleas found numbered 19,440, comprising 19,362 X Cheopis, 22 Astia and 56 Ctenocephalus. The flea ratio 3·1 per rat is much below the ratio usual in India.

(*b*) *Cholera.*—There were 38 cases of Cholera and 14 deaths, excluding cases occurring in quarantine stations amongst passengers who had not landed. In view of the weather and of the fact that our next door neighbours Siam, French Indo-China, and India were heavily infected, the figures are satisfactory.

(*c*) *Small-pox.*—There were 39 cases of Small-pox with 16 deaths. *Vaccinations.*—Forty-nine thousand four hundred and thirty-seven vaccinations and revaccinations were performed. Forty thousand seven hundred and thirteen were returned as perfect, seven hundred and thirty-six as modified, two thousand one hundred and twenty-three as failed and five thousand nine hundred and sixty-five as not seen.

(*d*) *Cerebro-spinal Meningitis* contributed ten cases and eight deaths.

OTHER INFECTIOUS DISEASES

(1) *Tuberculosis.*—Deaths registered numbered 2,526 (against 2,604 and 2,389 in the two previous years). Of these the Municipalities of Singapore and Penang, which together contain roughly half the population of the Straits Settlements, contributed 1,294 and 460 deaths respectively.

Like the Pneumonias, Tuberculosis is largely spread by overcrowding. The death-rate from this cause has not varied much in the quinquennium.

(2) *Malaria.*—In considering the deaths from Malaria, those registered as due to "Fever Unspecified" the majority of which are probably Malaria must be taken into account. Figures for the quinquennium are:—

Year	*Malaria*	*Fever Unspecified*	*Total*
1922	3,977	3,051	7,028
1923	3,430	2,946	6,376
1924	3,462	2,706	6,168
1925	4,235	2,043	6,278
1926	6,452	2,398	8,850

In Singapore Municipality where certification is more accurate than elsewhere, the malarial deaths rose from 962 in 1925 to 1,600 in 1926, while the numbers registered as due to Fever Unspecified were 345 and 386 for the two years.

In Penang Island Malaria deaths increased from 509 in 1925 to 881.

Turning to the mainly rural Settlement of Malacca deaths registered as due to Malaria were 1,728 against 1,114 in 1925.

In Province Wellesley, another rural area, the Malaria deaths rose from 1,372 to 1,783. The increases in Fever Unspecified in these two areas were immaterial.

(3) *The Dysenteries.*—They were responsible for 1,015 deaths against 857 and 842 in the two previous years. The classification was:—

Dysentery Amœbic	280
Dysentery Bacillary	293
Dysentery Unclassified	442
Total	1,015

(4) *Diarrhœa and Enteritis.*—They caused 1,169 deaths against 1,043 and 933 in the two previous years.

VENEREAL DISEASES

A separate Social Hygiene Branch of the Medical Department was formed under the charge of Dr. W. M. CHAMBERS in March, 1926. Dr. CHAMBERS, who had just returned from home, spent the previous six months in the study of modern social hygiene methods in England, Denmark, Germany and France.

Government appointed a Social Hygiene Advisory Board in Singapore, composed of representatives of Government, the Army, the Navy, the Municipality, the Straits Association, and other Public bodies of various nationalities. Most of the members are medical men. The Board held three meetings during the year.

A large amount of anti-venereal propaganda was carried out: films lent by the British Social Hygiene Council were shown, lectures were delivered and pamphlets in English, Chinese, Tamil and Malay, were distributed.

In-patients treated for venereal disease during the year numbered 5,371, while the out-patient attendances were 54,090.

Towards the end of the year the numbers of out-patients were increasing rapidly. The Clinic for treating seamen at Tanjong Pagar was specially successful.

Professor BOSTOCK HILL, a member of the Executive Committee of the British Social Hygiene Council visited the Branch in October and gave Government the benefit of his valuable advice.

A report by the Chief Medical Officer, Social Hygiene, is included as Appendix *L*.

LEPROSY

(*a*) The number admitted to institutions increased by 74 as against 103 in 1925.

		Remained	Admitted	Died	Absconded	Discharged	Remained
Men	Pulau Jerejak ...	703	147	117	22	4	707
	Singapore ...	36	81	10	11	8	37
Women	Penang ...	44	4	9	—	—	39
	Singapore ...	39	16	4	—	—	51
	Total ...	822	248	140	33	12	834

Deaths in 1925 were 143.

(*b*) A commencement was made with the building of sixty separate huts for lepers at the Male Leper Settlement, Pulau Jerejak.

The female lepers in Singapore were moved from their overcrowded quarters at Kandang Kerbau to a spacious camp at Trafalgar where their general health has much improved.

(*c*) *Treatment.*—Nearly all the lepers are voluntarily under treatment and the death-rate is still decreasing.

	1921	*1922*	*1923*	*1924*	*1925*	*1926*
Cases	810	868	888	891	996	1,070
Deaths	231	207	164	150	143	140

The pure expressed oil of Hydnocarpus has again given the best results.

Reports by Dr. E. D. Lindow, Medical Officer, Tan Tock Seng's Hospital, Singapore, and Dr. A. H. Wheatley, Deputy Medical Officer, Pulau Jerejak Leper Settlement, are attached as Appendices *A* and *B*.

HELMINTHIC DISEASES

Ankylostomiasis.—The total numbers of Ankylostomiasis cases treated and of deaths therefrom in the hospitals of the Colony for the past five years are:—

Year	*Remained*	*Admitted*	*Total treated*	*Deaths*
—	—	—	—	—
1922	... 91	2,064	2,155	163
1923	... 109	2,399	2,508	124
1924	... 87	1,800	1,887	120
1925	... 195	4,304	4,499	123
1926	... 138	3,996	4,134	142

The three years Hookworm and Rural Sanitation Campaign in cooperation with the International Health Division of the Rockefeller Foundation, began in January, after a preliminary survey during seven months of 1925.

Dr. Milford Barnes after rendering valuable services, left for New York in July. Dr. Paul Russell has written an exhaustive annual report, most of which is to be found in Appendix *E*.

IMPROVEMENT IN PUBLIC HEALTH

To show the improvement in public health during the past generation, I attach two graphs and three diagrams numbered *I, II, III, IV* and *V*.

I is a graph depicting the mean monthly death-rates in Singapore from all causes in the decennial periods 1903-1912, and 1913-1922 and in the 4 years 1923 to 1926. Material is not available to make such a graph for the whole Colony.

The graph shows plainly that the healthier months of the year are from September to March inclusive: the death-rate rises in April: the three succeeding months May, June and July are invariably unhealthy, while an improvement is usual in August.

The subsidiary peak in October is coincident with a secondary rise in the malarial death-rate, which was not uncommon in that month, but which with the increase in permanent anti-mosquito measures has almost disappeared.

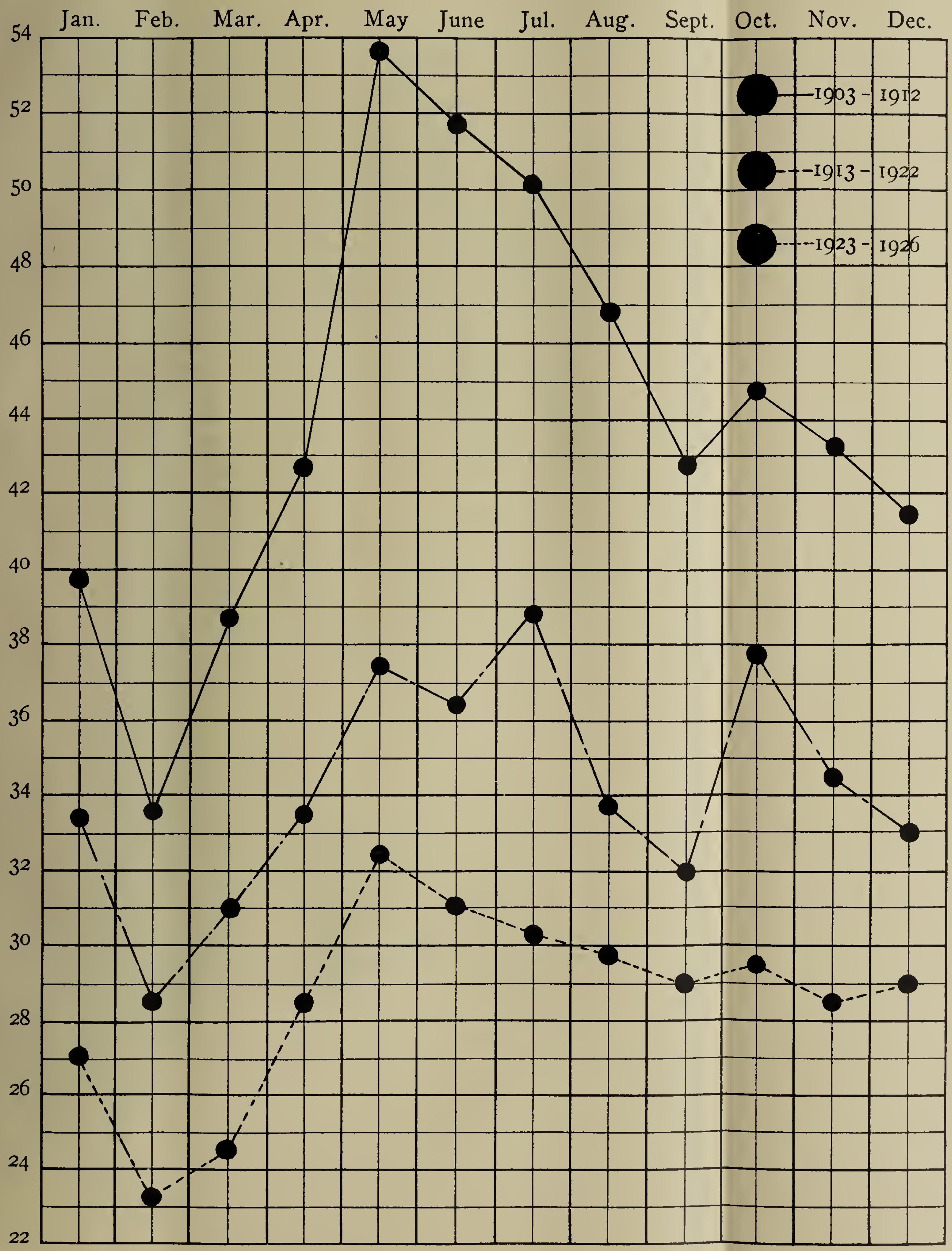
II is a graph giving a monthly comparison between two peculiarly unhealthy and malarious years, 1911 and 1926. The improvement in the latter year is in my opinion due more to permanent anti-malarial measures than to any other cause. There was a decrease of over 50 per cent in the infantile mortality in 1926 compared with 1911.

III is a Diagram showing the total deaths from preventable diseases and the total deaths from all causes during the year 1926.

IV is a Diagram showing the total number of cases of Infective and Preventable Diseases admitted to our Government Hospitals in 1926, and the deaths therefrom.

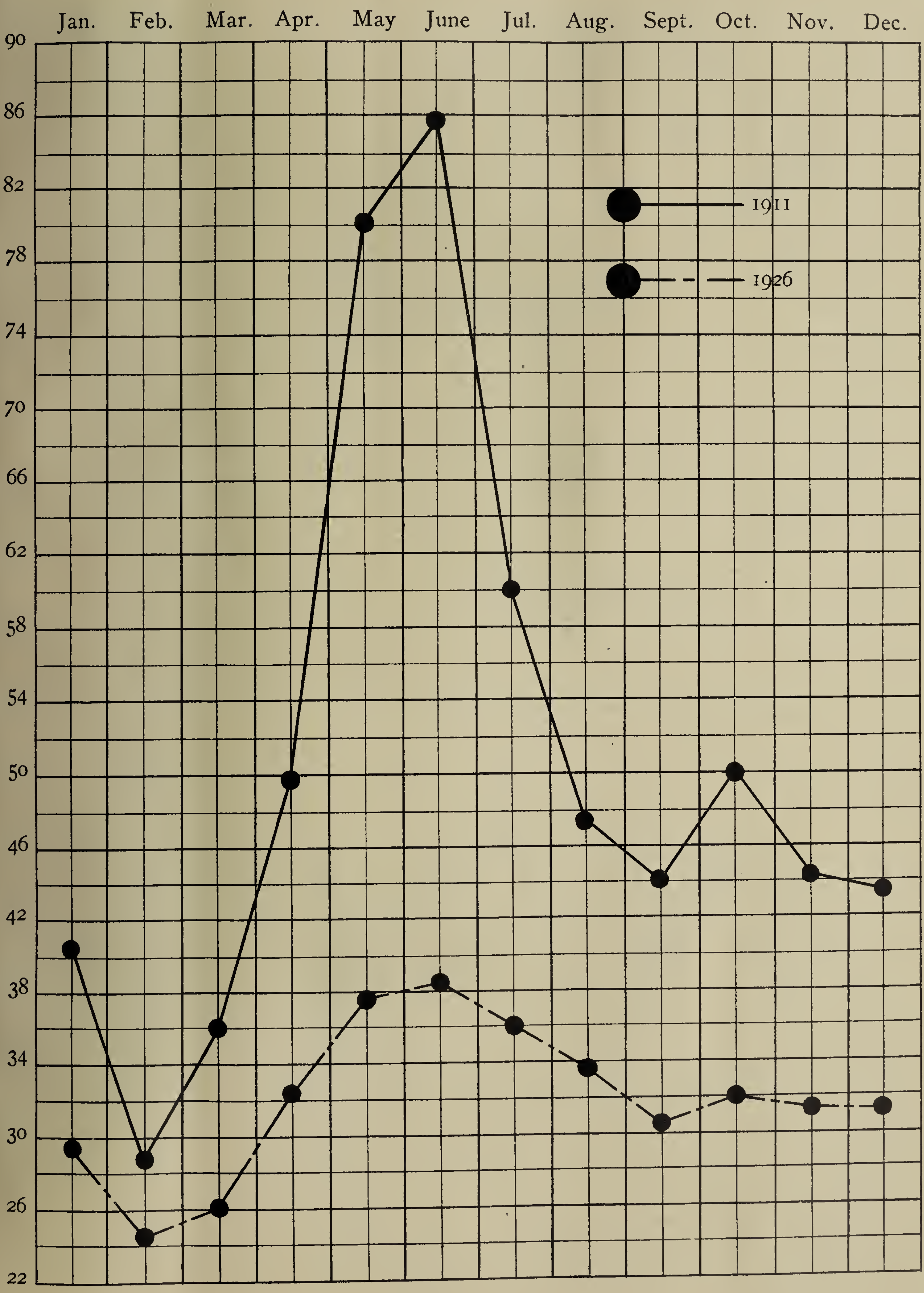
I

SINGAPORE
Mean Monthly Death-rate from all Causes



II

SINGAPORE
Monthly Death-rate from all Causes

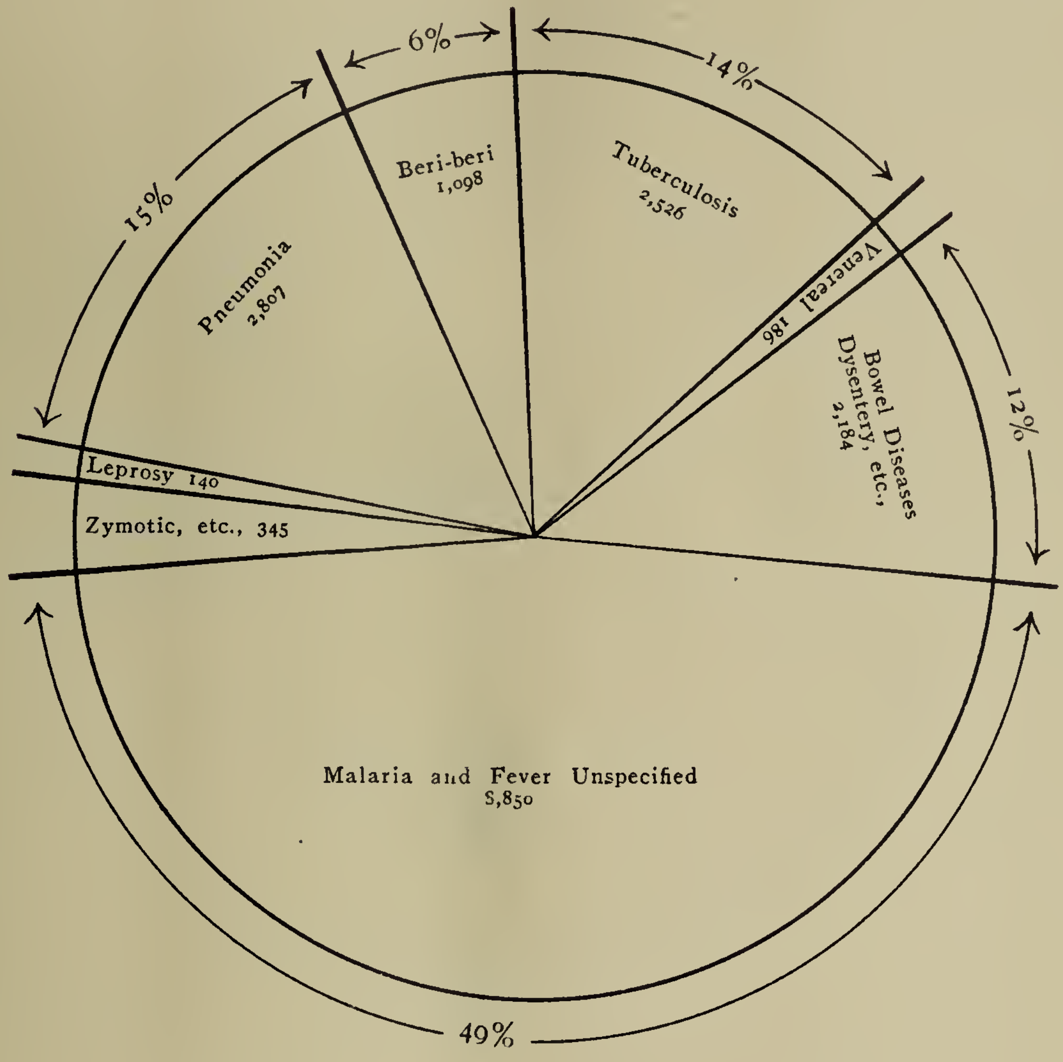


III

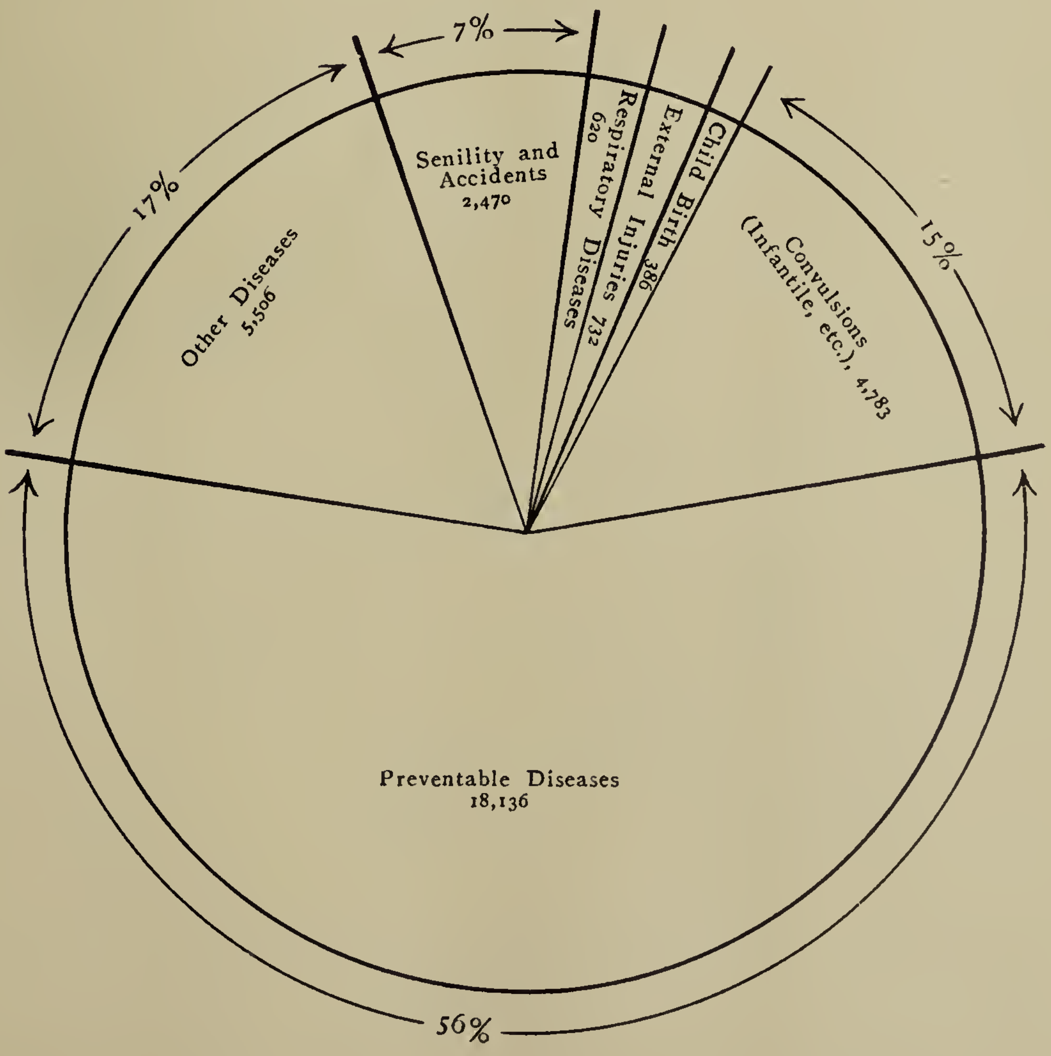
GENERAL STATISTICS FOR THE STRAITS SETTLEMENTS

DEATHS FROM INFECTIVE AND PREVENTABLE DISEASES REGISTERED IN THE STRAITS SETTLEMENTS IN THE YEAR 1926

TOTAL DEATHS 18,136 (PREVENTABLE)



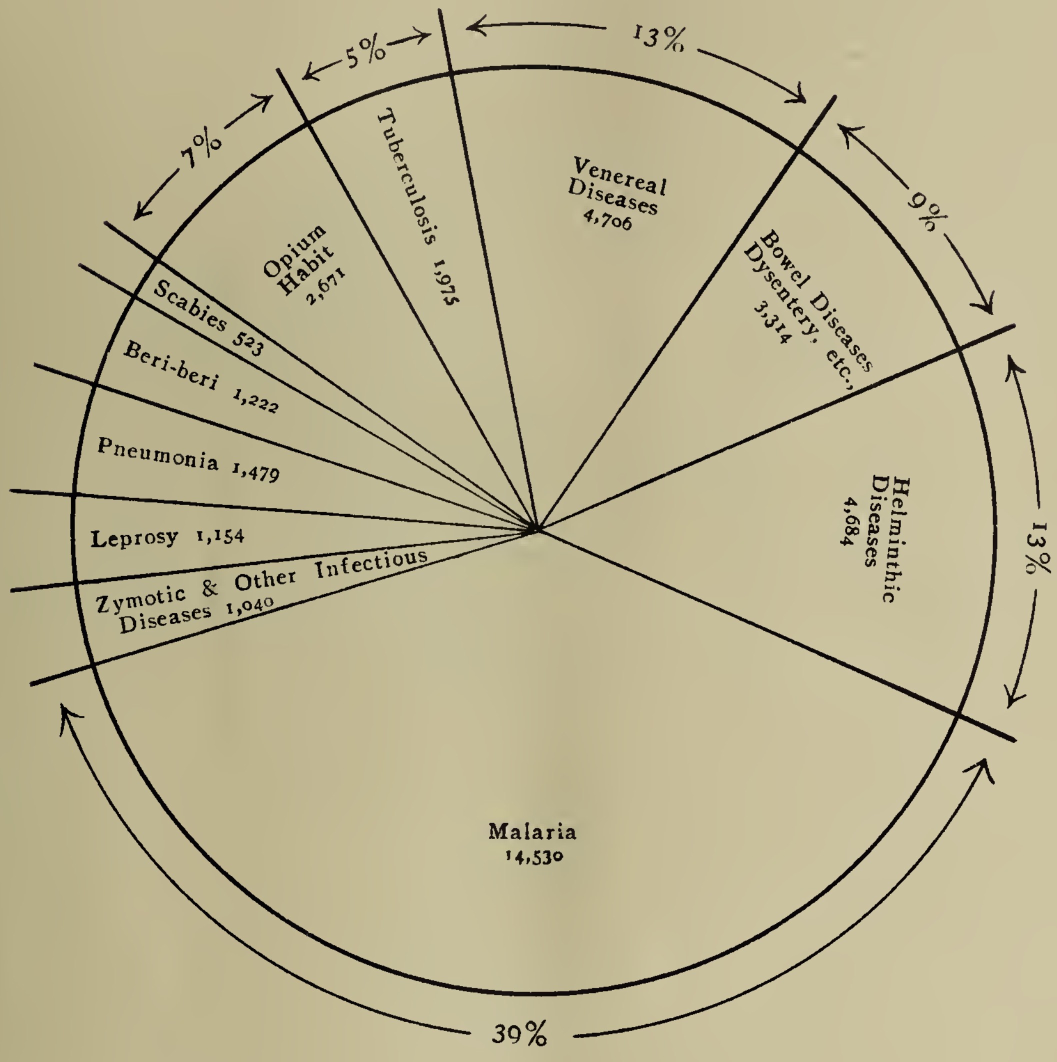
TOTAL DEATHS FROM ALL CAUSES 32,633



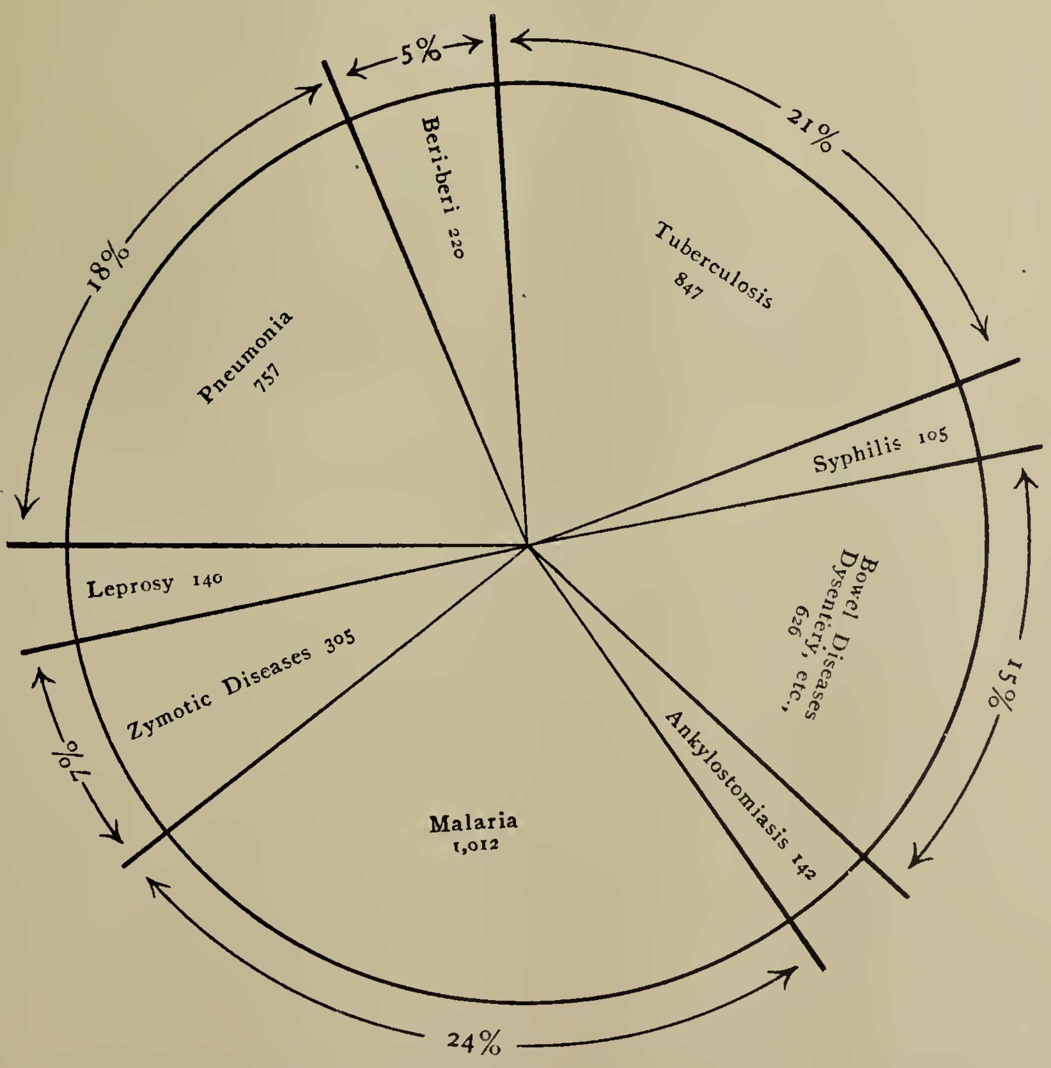
STRAITS SETTLEMENTS HOSPITAL STATISTICS

INFECTIVE AND PREVENTABLE DISEASES ADMITTED TO STRAITS SETTLEMENTS HOSPITALS DURING THE YEAR 1926

TOTAL CASES 37,298



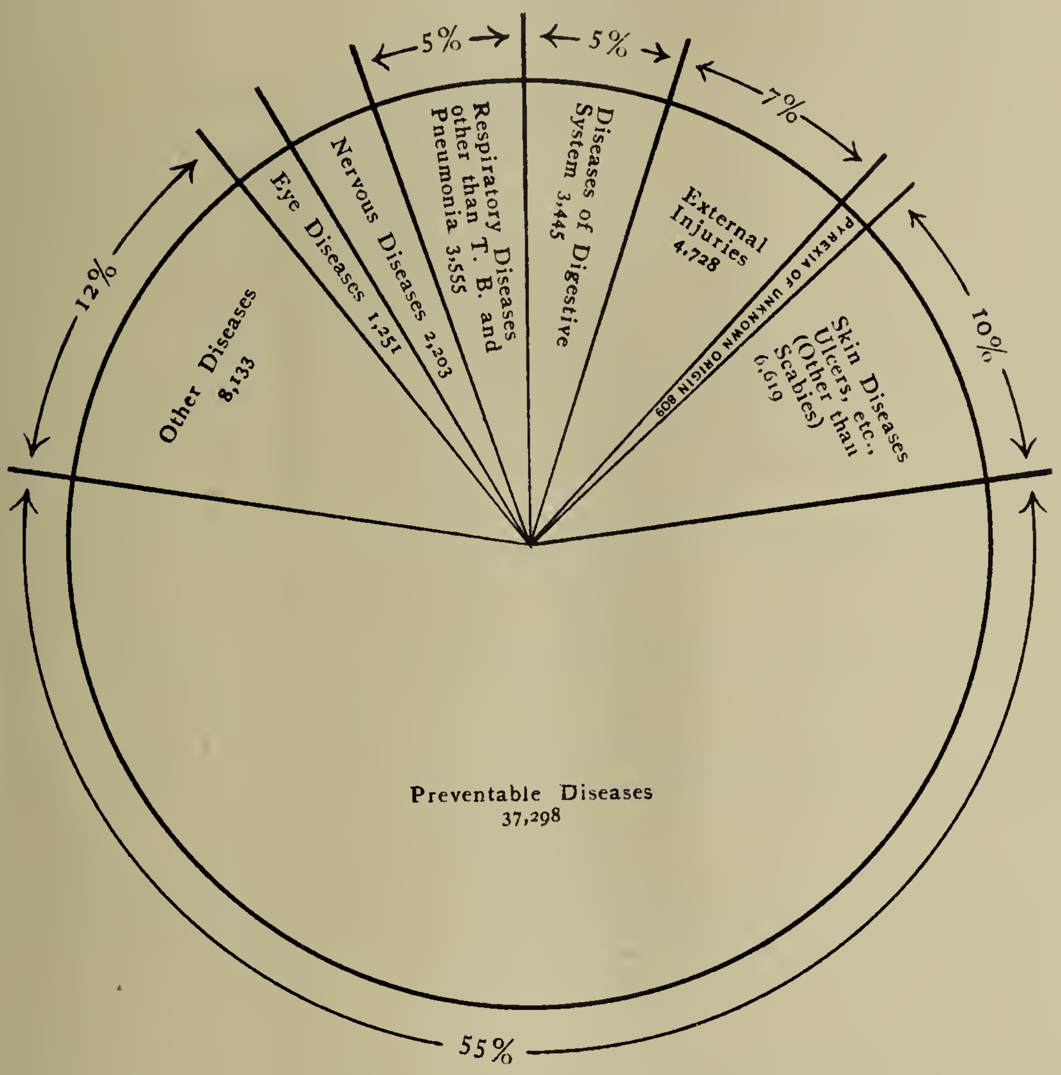
TOTAL DEATHS 4,154 (PREVENTABLE DISEASES) IN HOSPITAL



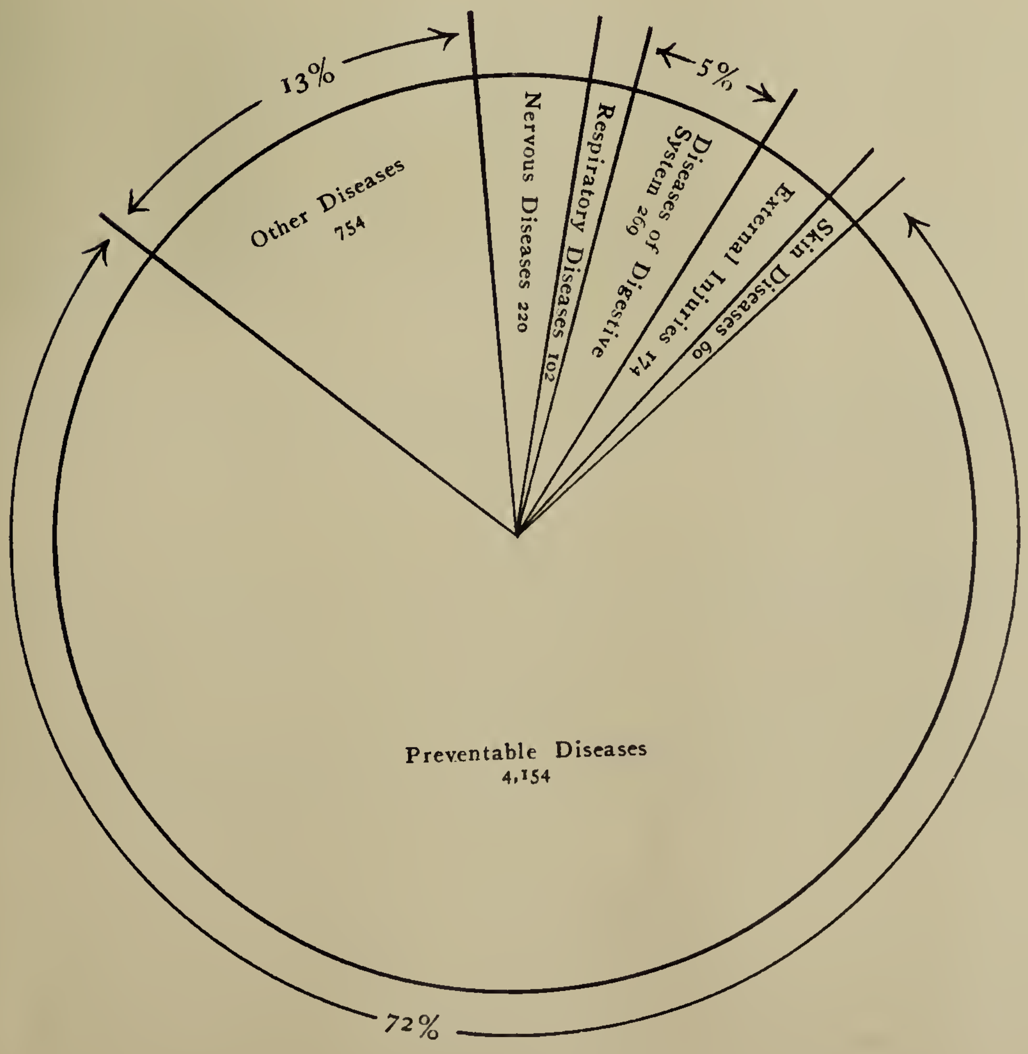
STRAITS SETTLEMENTS HOSPITAL STATISTICS

General Systemic and Preventable Diseases Admitted to the Straits Settlements Hospitals During 1926

Total Cases 68,014



Total Deaths 5,733 (From all Causes) in Hospital



V is a Diagram showing the total cases of disease admitted to our Government Hospitals in 1926, and the deaths therefrom, and differentiates between preventable and non-preventable diseases.

VITAL STATISTICS

Under heading Table *III*, the following ten Tables are appended:—

Table III A.—Estimated population with birth and death-rates for the years 1925 and 1926.

Table III B.—Quarterly death-rates for various parts of the Colony during the past three years.

Table III C.—Population estimated racially and collectively of the Straits Settlements for the years 1926, 1925 and 1924.

Table III D.—Births registered in the Straits Settlements during 1926 and their ratio per mille of population.

Table III E.—Births registered in the Straits Settlements during 1926 according to Nationalities.

Table III F.—Deaths registered in the Straits Settlements in 1926 according to Nationalities.

Table III G.—Deaths registered in the Straits Settlements in 1926 under different groups of ages.

Table III H.—Table showing the Infantile Mortality (under one year) in the Straits Settlements, including children born elsewhere.

Table III I.—Table showing the Infantile Mortality (under one year) in the Straits Settlements and Nationalities, excluding children born elsewhere.

Table III J.—Deaths registered in the Straits Settlements as regards certificates in the year 1926.

2. The number of births registered in the Straits Settlements during the year 1926 was 33,694 (males 17,482 and females 16,212) as compared with 31,665 (males 16,444 and females 15,221) in the previous year: this represents a crude birth-rate of 32·85 per thousand persons living as against 31·98 in 1925 and 32·29 in 1924.

3. In every 100 births registered there were 51·88 males and 48·12 females giving a percentage of 92·74 females to every 100 males born.

4. One thousand five hundred and sixteen still-births were registered in 1926 as compared with one thousand three hundred and forty-nine in the previous year—the percentage to those born alive was 4·50 as against 4·26 in 1925.

5. The highest birth-rate according to Nationalities was 41·19 per thousand of population amongst Malays, the Chinese coming next with a ratio of 32·50 per thousand of population *vide* Table *III E*.

6. The deaths from all causes in 1926 were 32,633 (males 21,265 females 11,368). The crude death-rate of 31·81 per thousand of population as against

27·26 in the previous year, is the highest since 1920. Death-rates for the last sixteen years are:—

Year	*Ratio per mille*	
1911 (Census)	46·46	
1912	39·01	
1913	34·93	
1914	34·13	
1915	29·15	Repatriation of several thousands of decrepit Chinese
1916	30·70	
1917	36·98	
1918	43·85	Influenza Epidemic
1919	33·04	
1920	33·20	
1921 (Census)	31·54	
1922	30·68	
1923	27·80	
1924	27·42	
1925	27·26	Lowest recorded death-rate
1926	31·81	

7. The highest racial death-rate was classed under Chinese with a ratio of 33·46 per thousand of population, the Malays coming next with a ratio of 31·25 per thousand of population.

8. It is always difficult to assess the true infantile mortality. The Municipal Health Officer, Singapore, gives the uncorrected infantile mortality for the city as 232. He states, however, that 4,731 infants came from China to Singapore during the year of whom 1,451 left the city.

If those who remained are added to the total births the infantile mortality in Singapore Municipality is reduced to 177·5 per thousand. The infantile mortality figures for the whole Colony do not take into account the infants arriving from abroad, except that a special note is made of the death of any infant resident less than three months in the Colony.

9. Table showing the sick, invaliding and deaths of European Officials of all ranks:—

	1924	*1925*	*1926*
(1) Total number of Officials on the Establishment	622	671	672
(2) Average number resident in Colony	538	673	547
(3) Total number on sick list	174	325	259
(4) Total number of days on sick list	1,474	3,726	3,728
(5) Total number invalided	3	10	7
(6) Total deaths	1	2	5
(7) Total deaths in the Colony	1	2	5
(8) Average daily number on sick list	·48	·89	·58
(9) Average number of days on sick list	8·47	10·2	10·21
(10) Percentage of deaths to number resident	·18	·35	·91
(11) Percentage of sick to the average number resident during the year	—	—	47·35

10. Table showing the sick, invaliding and deaths of Non-European Officials:—

	1925	1926
(1) Total number on the Establishment	—	5,815
(2) Average number resident	—	5,577
(3) Total number on sick list	—	2,928
(4) Total number of days on sick list	—	23,966
(5) Total number invalided	—	45
(6) Total deaths	—	42
(7) Average daily number on sick list	—	244
(8) Average number of days on sick list	—	8·18
(9) Percentage of deaths to number resident ...	—	·73
(10) Percentage of sick to number resident ...	—	52·50

III.—HYGIENE AND SANITATION

There is no Chief Health Officer for the Straits Settlements. I am, therefore, including in this section under the signature of the officers concerned, reports from the Acting Chief Health Officer, Singapore, Acting Senior Health Officer, Penang and Health Officer, Malacca; a report on the first year of our joint rural Sanitation Campaign by the Resident Health Officer of the International Health Division of the Rockefeller Foundation is attached as Appendix *E*.

The Port Health Administration is under the control of the Government Health Officers mentioned, and is therefore included in this section. The report on School Hygiene follows the reports of these officers.

As regards preventive measures against mosquito-borne diseases, a large amount of permanent anti-malarial drainage was again carried out in Singapore and Penang Islands, Province Wellesley and the Dindings, and a beginning was made in Malacca.

With the exception of a small amount of water-borne sewage in Singapore, the collection of the whole of the night-soil in the Straits Settlements is by hand: in some parts it is then dumped out at sea, in others it is incinerated or buried, and yet again it is often used as fertiliser.

Scavenging is performed in cities by the Municipal Authorities and in the country by Rural Boards; in both cases the refuse is incinerated.

The pipe water supplies are excellent in Singapore and Penang and are being greatly extended to meet the needs of the growing population; the extension in the case of Singapore is coming from the mainland of Johore. A good piped supply is now being introduced into Malacca town. In rural areas, some of the small towns and villages have piped supplies while many smaller villages, kampongs and isolated houses still depend upon shallow wells.

Offensive trades operate almost entirely in the municipalities where they are effectively controlled.

As regards labour in the rural areas, organised labour is engaged mostly on rubber estates and on public works. The larger estates employ medical officers, and have small hospitals or sick lines, from which serious cases are frequently transferred to Government hospitals.

The scheme under which the Malacca Agricultural Medical Board (Board of Planters) has grouped and assessed the whole of the estates in Malacca, engaged six medical officers and stationed them at convenient centres, and divided the medical charge of estates amongst them, has proved a success, and has helped to reduce the Malacca death-rate. Some of these medical officers have done good preventive work. The system under which each estate makes its own arrangement for medical attendance still prevails in Province Wellesley and Dindings: it sometimes results in superficial attention from visiting practitioners, who may live far from the area, and be too busy to do the work properly.

The health of the Public Works labour is directly cared for by the Medical Department.

Factories and shops in cities are under the control of the Municipal Health Officers.

The congestion in Singapore and Penang with the resultant over-crowding is an important factor in the heavy mortality from Tuberculosis, Pneumonia and Infantile diseases.

The inspection and control of food is carried out by the Municipal and Government Health Officers in their respective areas. There are markets at all centres.

Milk vendors, eating houses, meat shops, aerated water factories are licensed and inspected. Water, milk and other beverages, and foodstuffs both local and imported are regularly analysed, and action taken if indicated.

The only common deficiency disease is Beri-beri.

League of Nations Eastern Health Bureau

In my last annual report I recorded the opening of the League of Nations Far Eastern Health Bureau at Singapore in March, 1925, for the purpose of the rapid collection and dissemination of epidemiological information throughout the Far East.

Weekly reports are also sent to the Office Internationale D'Hygiene Publique at Paris, and to the League of Nations Central Health Organisation at Geneva.

The Bureau was opened after a preliminary International Conference held in Singapore at which most of the Countries in the Far East were represented.

At that Conference the foreign Delegates were insistent as to the necessity for forming an Advisory Council for the Bureau which should meet yearly in Singapore, and on which the various administrations in the Far East should be represented.

Such an International Advisory Council consisting of nominees of the various administrations in the Far East, was accordingly formed by the League of Nations, with instructions that it was to function as a special commission of the League of Nations Health Committee to which it would report. It was to meet once a year and take note in an advisory capacity of any or all of the activities of the Bureau.

The Advisory Council met for the first time in Singapore from 4th to 6th of January, 1926.

There were present—

Dr. L. Rajchman, Director, Health Section, League of Nations, Geneva (in the Chair).
Dr. J. S. C. Elkington, representing Australia.
Lt.-Col. J. D. Graham, representing British India.
Dr. P. A. Dingle, representing British North Borneo.
Dr. Wu Lien Teh, representing China.
Dr. A. R. Wellington, representing Federated Malay States.
Dr. l'Herminier, representing French Indo-China.
Dr. J. B. Addison, representing Hongkong.
Dr. Genzo Katoh, representing Japan.
Dr. J. J. van Lonkhuijzen, representing Netherlands East Indies.
Dr. M. Carthew, representing Siam.
Dr. A. L. Hoops, representing of the Straits Settlements.
Dr. H. F. Smith, Observer from the Philipine Islands.
Dr. G. E. Brooke, Director of the Bureau.

and Dr. Victor G. Heiser of the International Health Division of the Rockefeller Foundation.

Ceylon, which was represented at the opening Conference in 1925 by Dr. L. Nicholls, was unrepresented.

The Portuguese Far Eastern Colonies were not represented on either occasion.

Dr. Victor Heiser, Director for the Far East of the International Health Division of the Rockefeller Foundation, was present in virtue of the fact that the Rockefeller Foundation had rendered the establishment of the Bureau possible by the gift of $125,000 gold to the League of Nations, to be used as a subsidy for the Bureau during the first five years.

Omitting the Director of the Health Section of the League of Nations and excluding the two Americans, one of whom attended in a capacity of an Observer for the United States and Philipine Islands and the other as an Observer for the Rockefeller Foundation, six British and five foreign administrations were represented.

At the close of the meeting Lt.-Col. J. D. Graham, I.M.S., C.I.E., Sanitary Commissioner for the Government of India, was elected President of the Advisory Council and the five representatives of the Non-British administrations (China, Japan, Siam, Dutch East Indies and French Indo-China) were elected Vice-Presidents.

It was agreed that the President and Vice-Presidents might deliberate apart from the rest of the Council, but without executive power.

Any proposed new policy must receive the approval of the whole Council.

The Resolutions passed by the Advisory Council were as follows: —

I. The Advisory Council approves the Director's Report for 1925 subject to the modifications recorded in the minutes.

II. The Advisory Council wishes to record its appreciation of the work of the Bureau during the first ten months of its existence, and to express its thanks to Dr. Brooke for the intelligence, energy and devotion with which he has organised and directed the Far Eastern Bureau, and to which must be ascribed the successful result obtained.

III. The Advisory Council having considered the Report of the Finance Sub-Committee and approved of it, recommends that the Budget of the Bureau for 1926 to the total sum of $69,761 be submitted to the Health Committee of the League for approval.

IV. The Advisory Council having considered the report of the Code Sub-Committee, as attached, approves of the recommendations contained therein.

V. The Advisory Council—

Considering that the wireless transmission of the weekly bulletin in Code arranged through the generosity of the Government of French Indo-China from their station at Saigon, constitutes the most effective and economic means of communicating the weekly returns to all the interested sanitary administrations.

Considering that difficulties in the reception of the messages were experienced by numerous administrations.

Considering that several administrations succeeded in overcoming their difficulties.

Considering that the Public Health Commissioner of the Government of India made arrangements with the Director of Wireless for the re-broadcasting of the Bureau's weekly cable from the Bombay Station and that the message transmitted from Bombay to all India Stations is picked up by a considerable number of these stations, and by ships at sea.

Considering that the extension of the wireless transmission would represent an enormous saving for the Bureau, *Decides.*—That expert advice be obtained without delay as to the best methods for ensuring regularity and accuracy in the reception of the weekly bulletins;

That the wireless bulletins be supplemented by cables only at the express desire of the interested administrations and whenever possible at their own expense (preferably by prepaid cables at Government rates);

That the credits recommended for cables in the estimates for 1926 should be curtailed in relation to the extension of the wireless transmission of bulletins;

That the Weekly Fasciculus should give regularly all relevant information regarding the transmission and reception by wireless of the Bureau's messages.

Invites.—All the administrations of the four groups of ports, to supply the Bureau at the earliest possible moment with the following information:—

(*a*) What difficulties, if any, are experienced in picking up the Saigon message (give technical details).

(*b*) What steps, if any, were taken to overcome the difficulties (indicate technical methods employed).

(*c*) Which other wireless stations are regularly picked up by your station (indicate dates, hours, wave lengths and all requisite technical details).

(*d*) In particular are the powerful European Stations (St. Assizes. Rugby and Nauen) in regular communication with your station (give all technical details).

(*e*) Can the messages re-broadcasted from Bombay 09·00 and 17·00 G. M. T. each Friday after the weather message, on a wave length of 2,000 metres, be picked up regularly or otherwise, by your station?

(*f*) Does the application of the methods found effective by some of the stations (as indicated in Appendix *E*) give the desired solution?

(*g*) What suggestions can be offered for improving the reception of the weekly wireless message?

VI. The Advisory Council—

Noting that the Director of the Bureau has been requested from time to time to give information about the work of the League of Nations in general, and of its Health Organisation in particular, and considering it desirable that the Bureau should be enabled so far as practicable to supply such information, suggests that the Secretariat of the League might be invited to assist the Bureau in this respect, it being understood that such expenses as might be so incurred (supply of publications, etc.,) would be a charge on the Secretariat of the League.

VII. The Advisory Council—

Considering that the International Health Organisation should include in its programme of activities the promotion of studies and investigations into the great problems of public health in the East,

Considering that the claims of malarial research in the Far East are already recognised by the Health Committee of the League,

Considering that the testing of the value of oral vaccination against acute intestinal diseases is a matter of very considerable importance and that in order to give conclusive results the tests should be carried out in several countries in accordance with a scheme of inquiry agreed upon by the participating national health administrations and medical research institutes,

Considering that the *endemic foci* of cholera in the Far East present the most favourable field for elucidating some of the unsolved problems of the epidemiology of this disease, Considering that investigation into the rat flea fauna of different countries with respect to plague is a matter of great importance as a basis for the formulation of methods of control of non-pneumonic plague and particularly for its control in ports,

Considering that the study of conditions surrounding the epidemiology of pneumonic plague with regard to its endemic centres is a matter of much importance,

Considering that tuberculosis constitutes one of the greatest problems in the Far East and that prophylaxis by methods of preventive inoculation should be tested,

Recommends that a special expert committee or committees be set up, composed of directors of research and other experts of the several countries in order to draw up a programme of study and to agree on the procedure to be followed for the inter-communication of results obtained and the mutual co-operation in the carrying out of the inquiry;

Proposes that the technical secretariat of the expert committee or committees be provided by the Health Organisation of the League.

VIII. The Advisory Council—

Having been informed by the Director, Health Section, League of Nations that it should consider itself as part of the Far Eastern Commission of the Health Committee of the League of Nation,

Being convinced, after full discussion in open debate, that the Eastern Bureau, Singapore, is an integral part of the organisation of the Health Section, and that its present financial position of indebtedness to the generosity of the International Health Division of New York is a temporary one which must soon cease,

Feels compelled to record that in its opinion the activities of the Bureau represent an essential part of the League, which should therefore assume financial responsibility for the functioning of the Bureau.

The Council is confirmed in its opinion by the desirability which it recognises, and, to which it has given expression in a separate resolution, for the Health Section of the League of Nations to act internationally in regard to certain disease problems which pertain peculiarly to the Far East, and it has been further guided to this opinion by the fact that most of the administrations which are represented on it, are full members of the League on the allocation basis of first class powers.

IX. The Advisory Council—

Decides to appoint a President and five Vice-Presidents who may meet during the interval between the sessions of the Council in order to discuss questions to be brought up before the Council, for consideration and decision. The President and Vice-Presidents may formulate policies, which cannot become operative until deliberated upon and approved by the Council.

X. Resolved that the member for India be elected President, and that the members for Indo-China, Netherlands East Indies, Siam, Japan and China, be elected Vice-Presidents for 1926.

XI. The definition of a port was discussed and it was decided that the attention of the Paris International Sanitary Conference be directed to the necessity of including in the International Sanitary Convention a suitable definition of a port.

As regards the recommendation in Resolution VII for the formation of committees consisting of experts from various countries, to study certain diseases—

(1) A committee for the study of oral vaccination against intestinal diseases has been formed; several of its members are now conducting research on this subject in the countries where they are resident,

(2) A committee for the study of plague is being formed and is to meet during the VII Congress of the Far Eastern Association of Tropical Medicine at Calcutta in December, 1927.

During the year 1926 the Eastern Health Bureau under the control of Dr. GILBERT BROOKE further developed its primary function—the collection and dissemination of weekly telegraphic epidemiological information.

The number of ports communicating with the Bureau rose from 66 to 135. Information was obtained from a number of countries concerning the prevalence of infectious disease in the interior, as well as at ports. Touch was also kept with infected ships, and health authorities at their next ports of call were informed of their movements.

The use of wireless for the broadcasting of epidemiological information was greatly increased, leading to a saving of expense, though larger areas were served.

To this saving the use of Dr. GILBERT BROOKE'S second edition of his telegraphic AA Code also contributed. When Dr. GILBERT BROOKE went on leave in November he resigned the Directorship of the Bureau which he had held as a part-time post since the foundation of the Bureau in March, 1925.

He was succeeded by a whole time Director Dr. RAYMOND GAUTIER of the League of Nations Head Quarters Health Staff.

Dr. BROOKE'S great practical experience of Port Health Work, wide knowledge of health conditions in the Far East, and untiring energy, have laid a sure foundation for the Bureau and have assured its success.

An International Sanitary Conference was held in Paris during May and June, 1926, to draw up a new International Sanitary Convention.

Dr. F. R. SAYERS, Senior Health Officer, Penang, represented the British Colonies at this Conference.

The draft of a new International Sanitary Convention was agreed upon by the members of the Conference and will come into effect as soon as a sufficient number of Governments have deposited their ratification.

As regards the Far East most of the obligations laid on the Office Internationale D'Hygiene Publique by the new Convention will be carried out by the Eastern Health Bureau.

Briefly the main differences between the intelligence which the Bureau has so far collected, and which it will be called on to collect under the New International Sanitary Convention are two fold, firstly the supplying of information to the Bureau by the countries interested, is at present voluntary, the information called for by the Convention will be obligatory, secondly, the information so far supplied has referred in the main to ports, while the data supplied under the Convention will refer to countries as a whole.

SINGAPORE

RESUME OF WORK OF THE GOVERNMENT HEALTH BRANCH, SINGAPORE, (1926), BY DR. FREDERICK R. SAYERS, D.P.H., *Acting Chief Health Officer, Singapore*

I

(*a*) ADMINISTRATION DATA:—

1. *Staff*.—Number of Health Officers and Assistant Health Officers	7
Number of Inspectors, Overseers, etc.	14
Number of Clerks and Interpreters	7

Total Quarantine Station Staff	69
Number of Rural Mandores and Masons	32
Average number of coolies employed in Rural Districts	344

2. *Populations controlled as regards Health work:—*

(*a*) Estimated Rural Population	80,148
(*b*) Total Quarantine Contacts	78,963
(*c*) Gaol Inmates (daily average)	1,012
(*d*) Reformatory Inmates (daily average)	77

3. *Populations casually or partially controlled as regards Health work:—*

Maritime (Crew and Passengers examined exclusive of those quarantined)	471,480

4. *Finance:—*

	$	c.
1. Budget Appropriations for Health Branch	313,504	50
2. Revenue Recovered	85,398	45
3. Net cost	228,106	05

(*b*) TOWN AND OFFICE WORK:—

Number of Bills of Health issued	3,273
Ports against which Quarantine Restrictions were imposed	21
Prosecutions for breach of Quarantine and Prevention of Disease Ordinance	4
Number of bonds issued	19
Disinfection Certificates issued	589
Sanitary Inspections of Schools by Health Officer	139
Scholars examined by Medical Officer	5,338
Number of samples of mosquito larvæ sent for identification	60,150
Prosecutions for breach of Municipal (Rural Board) Ordinance	51

RESUME OF PORT AND OFFICE WORK, 1926

1. Number of different world ports from which steamers arrived	360
2. Number and names of ports Quarantined:—Amoy, Bangkok, Bombay, Calcutta, Canton, Hoihow Haiphong, Hong Kong, Johore Bahru, Kuching, Kobe, Madras, Negapatam, Rangoon, Saigon, Swatow, Shanghai, Siam, Tsingtao, Tourane, Yokohama	21

3.	Tonnage entering Singapore	12,776,470
4.	Number of ships entering port	7,981
5.	Number of ships examined	1,650
6.	Number of Pilgrim ships to Jeddah	14
7.	Number of Pilgrims examined	8,667
8.	Number of returning Pilgrim ships	7
9.	Number of returning Pilgrims examined ...	5,046
10.	Ships infected	50
11.	Fumigation and disinfection by disinfecting launches	635
12.	Fumigation by Cyanide Chloride gas	1
13.	Number of disinfection Certificates issued ...	589
14.	Amount received for disinfection certificates and fumigation charges	$46,237
15.	Crew examined	127,930
16.	Passengers examined	422,513
17.	Undertakings by Cabin passengers	521
18.	Chinese Immigrants examined	348,593
19.	Number of Bill of Healths issued	3,273
20.	Amount received for same in stamp fees ...	$16,150
21.	Amount received for Pilgrim bills of health ...	$70
22.	Corpses inspected in harbour	150
23.	Number of permits to import and export corpses ...	42
24.	Amount received for same in stamp fees ...	$410
25.	Water boats examined	45

26. Rats examined:—

Total 56; R. Diardi 46; R. Norwegicus 10.

27. Principal prosecutions:—

On 4th February, 1926 the Captain, Surgeon, and Chinchew of the s.s. *Wing Hong* which arrived from Amoy and Hong Kong on 30th January, 1926, were prosecuted for making a false entry declaration and concealing 4 cases of Small-pox. The Captain and Surgeon were fined $500 each; the Chinchew was fined $500 and 3 months' rigorous imprisonment and another 3 months' rigorous imprisonment if $500 was not paid. (Section 54, Ordinance No. 157).

On 29th April, 1926, prosecuted Captain, Surgeon and Chinchew of s.s. *Kalgan* which arrived from Amoy on 28th September, 1925, under Section 54, Ordinance No. 157 for making false declaration. Captain and Surgeon fined $50 each and Chinchew $100.

On 29th April, 1926, prosecuted LEE SENG MOH, deck passenger on s.s. *Kalgan* for concealing Small-pox. Fined $150 and costs or 14 days' rigorous imprisonment. Section 53, Ordinance No. 157.

CONDENSED RESUME OF SOME WORK OF PORT HEALTH OFFICE FOR 24 YEARS

Year	*Crew and Passengers examined*	*Passengers sent to St. John's Island*	*Visits to Vessels*	*Bills of Health Issued*
1903	321,365	21,253	806	1,000
1904	279,297	17,852	712	1,036
1905	323,431	12,109	1,279	1,220
1906	493,021	30,076	1,625	1,674
1907	377,325	25,408	1,226	1,318
1908	303,484	29,356	1,506	1,344
1909	291,625	15,072	1,251	1,299
1910	467,868	35,062	1,920	1,200
1911	538,291	53,961	2,100	1,800
1912	539,677	56,726	1,927	2,145
1913	506,925	56,838	1,818	1,582
1914	402,583	18,193	1,803	1,802
1915	200,978	3,335	821	1,563
1916	426,584	9,738	1,617	1,726
1917	277,442	78,881	694	1,915
1918	284,198	24,182	1,709	2,086
1919	411,921	28,318	2,130	2,160
1920	507,176	31,991	2,023	2,878
1921	511,747	8,950	1,851	2,951
1922	369,072	15,343	1,552	2,720
1923	395,583	7,374	1,360	2,718
1924	408,419	39,053	1,433	2,912
1925	366,671	46,063	1,018	3,204
1926	550,443	78,963	1,650	3,273
Total	9,519,125	854,097	35,831	47,526

The Sixth Annual Training Course for the Diploma of the Royal Sanitary Institute began on May 1st and ended on November 3rd.

The number attending the Course was limited in order that each student could receive personal attention in his practical training.

There were 20 candidates from the Federated Malay States, one from Sarawak, and five private students.

Twenty students were successful in obtaining the Diploma of the Royal Sanitary Institute.

During the course there were 155 lectures and 52 demonstrations in the subjects outlined in the syllabus.

The examination and facilities for teaching were inspected by Professor BOSTOCK HILL who declared that they were adequate to the requirements of the Royal Sanitary Institute of Great Britain.

Quarantine Station:—

1. Total passengers admitted during the year	78,963
2. Greatest number admitted in any one day (12/1/26)	3,026
3. Maximum number in residence on any one day (14/9/26)	4,811

4.	Minimum number in residence on any one day (3/12/26)	3
5.	Total sick treated in Hospital *i.e.*, total admissions during the year and patients remaining in Hospital on 31st December, 1925 ...	673
6.	Average daily number of sick in Hospital ...	38.101
7.	Maximum number in Hospital on any one day (8/2/26)	77
8.	Minimum number in Hospital on any one day (24/7/26) ... ... (*Note*—On 23 days there were none in Hospital).	1
9.	Total deaths during the year—In Hospital 106; Outside 36	142
10.	Death rate amongst total treated	154.07 *p.m*
11.	Total number of deaths among cases treated ...	106
12.	Total cases of Cholera admitted	103
13.	Total cases of Plague admitted	—
14.	Total cases of Small-pox admitted	57
15.	Number of vaccinations (Small-pox) ...	35,404
	Number of Municipal Contacts admitted—	
	Small-pox ...	129
	Plague ...	—
	Cholera ...	11
	C. S. M. ...	56
16.	Number of Government Contacts admitted—	
	Small-pox ...	38
	Plague ...	—
	Cholera ...	3
	C. S. M. ...	—
17.	Number of Municipal Contacts who developed infectious diseases on the Island	1
18.	Number of Government Contacts who developed infectious diseases on the Island ...	1
19.	Number of non-infected ships whose passengers subsequently developed infectious diseases on the Island (1 out of 176)	1
20.	Number of infected ships whose passengers subsequently developed infectious diseases on the Island (15 out of 44)	15
21.	Number of gallons of Singapore water pumped up	2,861,376
22.	Cases treated as out-door patients (Contacts and Staff)	732
23.	Total births 1926 (5 males and 7 females) ...	12
24.	Re-vaccination total	4,905
25.	Total Inoculation with Anti-cholera Vaccine ...	28,424
26.	Total Inoculation with Anti-meningococcal Vaccine	1,466

F. R. SAYERS,
Acting Chief Health Officer,
Singapore.

SINGAPORE (RURAL)

By J. W. Scharff, M.D., D.P.H., D.T.M. & H.

1. The Rural Area of Singapore is an area of 188½ square miles with an estimated population of 80,148. This area is situated outside the Municipal city boundary and includes many islands in the vicinity of the port.

2. The Health Officer in charge of the Rural Area controls also the sanitation of Government Offices and Hospitals within the Municipal limits of Singapore, and co-operates with the Municipal Health Department, and the Sanitary Department of the Singapore Harbour Board, in cases where coordination of preventive health measures are called for.

3. For administrative purposes the Rural Area is divided into five Sanitary Districts each comprising approximately 37 square miles as follows: — Siglap (with an estimated population of 23,152) Paya Lebar (population 16,595) Bukit Timah (population 11,240) Pasir Panjang (population 8,855) Seletar (population 9,442). Each of these districts, except the last, is provided with a Government Outdoor Dispensary which forms a convenient centre from which both preventàtive and curative measures are dispensed to the public.

4. *Staff.*—An Assistant Health Officer (Dr. Fernandez) is in charge of the general sanitation of villages and estates, while a European Chief Sanitary Inspector, with training in sanitary engineering is responsible for the anti-malarial drainage. The Office Staff includes one sanitary inspector (Town), one Chinese interpreter, one clerk, a surveyor and three assistants (overseers), a mosquito collector and three assistants, one storekeeper, one mandore, three peons, and an office coolie. The subordinate staff for field sanitation and anti-malarial oiling includes five district sanitary inspectors, one overseer, one mason, six mandores, one hundred and four coolies; and for anti-mosquito drainage, one sanitary inspector, three overseers, two lorry drivers, eleven masons, fourteen mandores, two hundred and forty-two coolies.

5. *Statistics.*—

The following table shows the population, deaths, births, and infantile mortality rates for the year 1921-1926, inclusive.

Year	Population	Total deaths	Crude death-rate	Total Births	Birth-rate	Infantile Mortality Rate
1921 ...	68,003(Census)	2,161	31·77	1,942	28·55	233·9
1922 ...	70,432	1,984	28·17	2,043	29·01	209·5
1923 ...	72.861	2,019	27·71	1,864	25·58	265·6
1924 ...	75,290	1,957	25·99	2,641	35·07	214·6
1925 ...	77,719	1,994	25 65	2,298	29·56	228·02
1926 ...	80,148	2,637	32·90	2,760	34·43	222·4

The rise in the death-rate in the year 1926 is accounted for by the unhealthy climatic conditions that prevailed.

6. *Infectious Diseases.*—

The Rural districts were remarkably free from infectious diseases. There were no cases of plague, cerebro-spinal fever or diphtheria, and only two cases of small-pox and one of cholera. Seventeen cases of measles, and nine of chicken-pox, were registered and dealt with.

Six thousand five hundred and eighty-five vaccinations were performed as compared with 5,645 and 3,002 during 1925 and 1924 respectively.

The following were the results obtained: —

——	Perfect	Modified	Failed	Not Seen	Total
Primary vaccination ...	1,913	2	36	55	2,006
Revaccination ...	959	8	2,054	1,558	4,579

Disinfection and Disinfectants

Forty-four disinfections were carried out in the Rural Area. The various Government Offices, Hospitals and the Quarantine Station were served with disinfectants from the Central Sanitary Store, and a useful dust allaying and disinfecting mixture for wooden floors consisting of Kerosene 3 parts, Crude Oil 8 parts, Izal 1 part, was supplied to public buildings to the amount of 2,936 gallons.

Lepers

Five lepers were discovered in hiding. One of these was allowed to remain in isolation, and has undertaken to obtain treatment from a local practitioner; the others were sent to the leper asylum for treatment.

The number of lepers in isolation and under supervision is now seven, there is little doubt that there are a number of others not yet located. Two lepers who were treated and declared free from infection, are residing in the rural area.

7. *General Sanitation.*—

Under this heading are included: Village scavenging and conservancy: Inspection of water supplies: Control of cattlesheds, dairies, and piggeries: Inspection of markets, and food supplies: Surveys of sites and building plans: Rubber estate and factory supervision: Sanitary control of schools: Medical and sanitary supervision of police stations: Health teaching and propaganda.

The estimated number of houses in the rural area is 15,393. The Sanitary Inspectors made 11,273 routine house-to-house inspections, and a number of similar inspections were carried out by the Health Officer and his assistant in cases of difficulty or complaint. The sanitation of Government buildings within municipal limits was carried out, and necessitated 393 visits.

Village scavenging and refuse collection is organised by the health branch, and all the villages are served with one or more modern incinerators accordin to their size. Two thousand seven hundred and ninety-one cubic feet of rubbish were burnt daily. The amount of consumable refuse in all districts, and particularly in the mukim of Siglap, is steadily increasing, in consequence of the greater number of city workers living in the country who avail themselves of improved transport facilities.

An increase of staff, additional bullock carts and handcarts, were requisitioned during the year. A new double incinerator of the standard type with a capacity of 1,600 cubic feet has been erected off Changi Road. Two hundred and thirty-nine demonstration latrines (Dr. Baeza's type) have been distributed in certain chosen centres in the kampongs and villages at Bedok, Paya Lebar, Bukit Timah and Pasir Panjang. The whole village of Bukit Panjang has been laid out on model lines, with back-lanes, drains, sanitary latrines and concrete wells. Incidental to the obvious improvement to health, the value of land there is said to have increased fourfold owing to the improvements effected. A system of nightsoil control in which a contractor is responsible to the Health Officer has been started in Bukit Timah, Bukit Panjang and Pasir Panjang as well as in Siglap. A vigorous campaign against the pollution of ground with nightsoil has been undertaken in connection with the anti-hookworm campaign of the Rockefeller foundation; 257 insanitary latrines were demolished, and 386 new latrines erected by owners of houses.

Water Supplies

The recent extension of the municipal water supply into the rural area has been of great benefit to those who can draw their supplies from this source. Only 9 out of 31 wells examined were free from dangerous contamination. Thirty-seven wells were condemned and a similar number of new wells constructed, of these 15 were drinking wells made in connection with the construction of subsoil drains. The latter are exceedingly simple to construct, and water supplied in pipes carrying pure spring water is maintained at an even level throughout the year.

During the year the inspectors made 4,303 visits to coffee shops, butchers' shops, slaughter houses, grocers' shops and markets. Of the former 153 were licensed by the police on the recommendation of the Health Officer. Piggeries numbering 739, and dairies and cattlesheds to the number of 95, were inspected. Action was taken against the owners of two insanitary dairies. They were prosecuted and fined $10, subsequently the conditions improved in one dairy, and the other is under notice for demolition. Under the present condition of dairy-farming in Singapore it is fortunate that fresh milk has a very limited sale.

Diseased and unlicensed dogs to the number of 231 were reported to the police.

A public market was opened off Joo Chiat Road in June. Market by-laws were prepared and passed by the Rural Board. Food on sale is regularly inspected. The trade of hawkers who sell food from open wicker baskets, is diminishing, and the conditions under which they carry their wares is controlled as far as possible.

New buildings to be erected in village areas require the approval of the Rural Board Engineer and the Rural Health Officer. Two hundred and ten building plans were scrutinised, and the sites of the proposed buildings inspected. Alterations of the sanitary arrangements or of sullage drains were made in the majority of the plans submitted, and 141 buildings were approved. Housing conditions in Siglap are causing anxiety; there is considerable overcrowding and ill-health, and phthisis is more common than the registered causes of death indicate. An approved scheme of lay out for houses and drainage is under consideration.

Rubber Estates, Factories and Quarries

Owing to the prosperity of the local rubber industry and the gradual exclusion of factories from the city, the number of large factories in the rural area has increased to 27; they employ a large number of coolies who are usually not housed in the factory premises but live in the rural villages. The sanitary arrangements in the majority of the factories are defective and action is being taken to remedy these conditions.

There are 96 rubber estates and 6 granite quarries registered, with a labour force of over 25 coolies in each. There is a recorded population of 7,464, and there were only 19 deaths amongst coolies and dependants. Health records are submitted monthly, but with the exception of the three large European estates, none of the returns are satisfactory, and indicate that sick labourers are either left to their own devices, or drift to hospital without reference to their employer.

Police Stations in the rural area to the number of 12 were visited weekly or in some cases daily by the sanitary inspector in addition to the routine inspection by the health officer. The police notify cases of infectious disease.

The reports of births and deaths registered at each police station are collected and scrutinised. The sanitary condition and medical supplies of each station are recorded, and police reporting sick are visited in their homes.

Three hundred and twenty-four visits were made to the schools of which 8 are English and 17 are Vernacular or private schools. Sanitary improvements were effected in four; latrine accommodation is now satisfactory in the majority. There has been close co-operation with the school health officer.

HEALTH TEACHING AND PROPAGANDA

The training course on practical sanitation in connection with the diploma of the Royal Sanitary Institute extended for six months from 1st May to the end of October. Twenty-six students were instructed daily in each district or had various inspection duties assigned to them. The departmental sanitary inspectors received instruction in hygiene from time to time: special stress is laid on the necessity for educating the public rather than compelling them into sanitary reforms that they can not understand. Posters and health exhibits were shown at the dispensaries. Visits of inspection to the rural area by eminent medical authorities notably by Sir RONALD ROSS, Professor BOSTOCK HILL and by the Delegates of the League of Nations, and by members of the British Medical Association, took place during the year.

ANTI-MOSQUITO WORK

The protection of the rural population from malaria forms an important section of the activities of the Health Branch.

An annual vote of $100,000 available for this purpose each year since 1922 has made it possible to undertake measures for the permanent control of malaria in village areas that were notoriously malarial.

Statistics have been collected in the rural area since the latter part of 1920. Not only has a steady improvement in the prosperity and well-being of the inhabitants been evident, but the spleen rate of children has declined during the intervening years in the following proportion.

District	Spleen percentage of children aged 1–10		No. of children examined	
	1921	1926	1921	1926
Bukit Timah	39·6	3·6	106	139
Paya Lebar	26·3	1·02	38	196
Woodlands	62·5	7·4	24	27
Seletar	9·1	0·8	32	119
Siglap	3·4	1·8	89	254
Pasir Panjang	5·5	3·4	54	147

The anti-mosquito measures adopted have been progressive. The breeding places for dangerous mosquitoes within 20 chains of the villages of Bukit Timah, Bukit Panjang, Woodlands, Paya Lebar, and Pasir Panjang have been oiled, the proximal ravines then drained and the oiling areas gradually extended further into the country, or new protection zones formed, according to the areas where malaria is endemic. The visit of Sir RONALD ROSS in December, 1926, and his approval of the measures taken for malaria control in the rural area, is a source of satisfaction.

More than 50 miles of subsoil pipes and 4½ miles of open concrete channels have been laid protecting an area of approximately 5 square miles, while oiling areas now extend another 4½ square miles beyond the permanently protected zone.

The cost has been as follows (an average of 70 cents per head per annum)—

	$
1922	19,350
1923	74,120
1924	54,080
1925	68,078
1926	105,445*

The details of the work done during 1926 are summarised below.

In addition to mosquito control in the Rural Area, an extensive oiling programme organised since June, 1926 to protect the General Hospital from mosquitoes has met with considerable success. A mosquito collector is employed in searching for and destroying the breeding places of domestic mosquitoes in Government quarters, chiefly Stegomyia. A monthly mosquito index is tabulated from the record of these inspections.

Researches into comparative cost and efficiency of oiling and of anti-malarial drains have been made. Experiments on the control of Anopheles ludlowi with Paris Green have been carried out, and will be continued as soon as a larger supply of Paris Green becomes available.

A complete record of mosquito breeding places discovered since 1921 is exhibited at the Central Sanitary Depôt: plans of mosquito surveys are prepared and collections of mosquitoes are being made.

Student Sanitary Inspectors are taught the practical significance of mosquito identification, and laboratory exhibits and experiments upon the destruction of larvæ are supplemented by field excursions and instruction in oiling and drainage methods.

Every opportunity is taken of showing the public the larvæ of mosquitoes and explaining the reasons for their destruction.

Details of anti-mosquito work done during 1926.—

In connection with the drainage of breeding places for dangerous mosquitoes 34,588 feet of sub-soil drains and 16,187 feet of open concrete channels were laid, and 9,973 feet of open earth drains were cut. Thirty thousand eight hundred and fifty-one gallons of a standard oil mixture consisting of Solar oil (50 parts) Kerosene (5 parts) and Crude oil (oil fuel) 10 parts were sprayed on breeding places of mosquitoes. The chief places so oiled were in a radius of one mile from the villages of Bukit Timah, Bukit Panjang and Woodlands, half a mile around the reformatory school, one mile on each side of Serangoon Road from the 5th—7½ milestone, in the neighbourhood of the Convalescent Bungalow, in the village of Pasir Panjang, at Alexandra Barracks, in the mukim of Siglap, and around the General Hospital.

Nine square miles of ravines and swamps were surveyed. Mosquitoes were collected over an area of more than 25 square miles and over sixty thousand specimens identified.

The premises of 26 land-owners were drained and maintenance work carried out in 51 such areas. Drains were constructed and maintenance work done in existing drainage systems on various sections of crown land and on railway reserves in Bukit Timah, Paya Lebar and Pasir Panjang districts.

A list of annual records is appended.

J. W. SCHARFF,
Health Officer, (Rural).

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*Including $10,313 recovered for work done in private properties and $4,868 refunded to Government.

RETURN OF MOSQUITOES COLLECTED AND IDENTIFIED DURING THE YEAR 1926

MONTHS	No. of breeding places where larvæ were found	A. Sinensis	A. Barbirostris	A. Fuliginosis	A. Vagus	A. Kochi	A. Maculatus	A. Karwari	A. Ludlowi	A. Aitkini	A. Lencosphyrus	A. Umbrosus	Culex sp.	Stegomyia sp.	Total number of larvæ collected and identified
January	73	...	...	...	16	254	123	302	...	59	...	...	545	1,945	3,244
February	120	112	...	...	126	358	470	176	...	52	26	23	1,177	2.005	4,525
March	125	21	...	...	90	347	778	607	...	...	56	7	855	1,620	4,381
April	137	186	...	...	312	629	552	93	...	65	2	...	2,655	1,010	5,504
May	139	28	...	...	60	656	290	426	...	...	...	35	2,611	1,915	6,021
June	67	12	...	...	60	336	55	333	...	...	...	11	1,500	1,030	3,337
July	106	52	16	...	732	463	145	181	...	...	...	46	2,914	720	5,269
August	106	112	30	...	640	426	264	200	75	10	20	...	1,790	450	4,017
September	134	4	8	...	318	359	190	353	71	...	15	28	1,704	1,390	4,476
October	141	40	...	...	463	614	88	278	...	...	20	16	1,640	2,710	5,869
November	177	91	...	1	533	331	31	1,285	45	4	...	...	970	2,600	5,891
December	162	117	...	1	319	283	50	318	30	...	...	...	1,885	4,613	7,616
Total ...	1,487	811	54	2	3,669	5,056	3.036	4,552	221	190	139	166	20,246	22,008	60,150

MALARIA CASES TREATED AT GOVERNMENT DISPENSARIES

Quarterly Numbers	1923					1924					1925					1926				
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total
Bukit Timah ...	250	435	338	259	1,282	240	276	212	239	967	170	282	343	175	970	125	240	200	120	685
Paya Lebar ...	111	113	67	58	349	56	85	51	48	240	31	53	61	54	199	45	71	75	43	234
Total ...	...	...	...	...	1,631	...	...	...	...	1,207	...	...	...	...	1,169	...	...	...	...	919

GALLONS ANTIMOSQUITO MIXTURE SPRAYED ON BREEDING PLACES DURING 1926

District	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	Remarks
Pasir Panjang ...	..	139	587	210	...	...
Bukit Timah ...	945	2,969	2,951	4,053	...	...
Paya Lebar ...	1,701	1,588	1,951	4,474	...	...
Gaylang ...	185	441	1,545	810	...	...
Town ...	412	1,015	1,495	3.380	...	Chiefly at General Hospital
Total ...	3,243	6,152	8,529	12,927	30,851	Cost 10,290

MATERIALS USED IN THE CONSTRUCTION OF ANTI-MALARIAL DRAINS

Material	——	Number	Approximate cost in
			$ c.
Subsoil pipes	4″	15,356	2.456 96
Do. do.	6″	13,343	2,802 03
Do. do.	8″	5,889	1,648 92
Inverts	18″ × 2′	2,134	2. 34 00
Do.	12″ × 2′	1,533	996 45
Do.	9″ × 3′	1.710	1,368 00
Do.	12″ × 3′	1,111	1,199 88
Do.	6″ × 3′	130	70 20
Slabs	2′ × 2′	7,275	5,092 00
Do.	2′ × 1′	1,683	673 20
Cement	casks	522½	3,020 50
Broken Bricks ...	cu. yards	389	1,222 00
Wooden pegs	...	70	10 50
Concrete pegs	...	470	70 50
Seriah planks	...	155	149 00
Baku piles	...	50	30 00
Expanded metal ...	sq. feet	320	48 00
Iron grids	...	3	6 00
Total ...	...	...	22,998 14

PENANG

By Dr. A. G. H. Smart, M.B., D.P.H., D.T.M. and H. *Acting Senior Health Officer, Penang*

(*a*) The Public Health administrative districts in the Northern Settlement are shown below with the officer responsible for each under the general supervision of the Senior Health Officer.

District	Officers Responsible for	Other duties of Officers
1. Penang Harbour	Port Health Specialist	...
2. Quarantine Station, Pulau Jerejak	Deputy Health Officer (Quarantine)	...
3. Leper Settlement, Pulau Jerejak	Deputy Medical Officer (Lepers)	...
4. Penang Island Rural Area	Assistant Health Officer (Rural)	...
5. Province Wellesley Northern and Central Districts	Medical and Health Officer, Province Wellesley, Northern and Central	Medical Officer's Duties
6. Province Wellesley Southern District	Medical and Health Officer, Province Wellesley, South	Do.
7. The Dindings	Assistant Medical and Health Officer, Dindings	Do.

(*b*) Dr. A. G. H. Smart relieved Dr. F. R. Sayers, who proceeded on leave in March, and continued in charge until the end of the year.

(*c*) A Lay Superintendent is stationed at the Quarantine Station to assist the Deputy Health Officer, and since the middle of the year a similar appointment has been made at the Leper Settlement at Pulau Jerejak, and the control of routine sanitation has now been largely taken over from the Deputy Medical Officer leaving him free to devote more time to his purely medical duties.

(*d*) The staff of eight Sanitary Inspectors come under the control of the Senior Health Officer as from the end of the year under review: hitherto they have been Rural Board servants.

(*e*) There were two Mosquito Inspectors or Collectors; the man stationed at Lumut, in addition to his ordinary work, took over charge of the maintenance of anti-mosquito permanent works there; in any difficulty he was advised and helped by the Assistant Engineer, Dindings. Both of these officers will come under the Sanitary Inspectors' scheme from the beginning of 1927.

(*f*) The New Dispensary on Penang Hill was completed during the latter half of the year. As before constant supervision was exercised over all labour employed on the Hill, and it is hoped to make this more complete and thorough during the coming year.

(*g*) Vaccinations, including those done at the Quarantine Station, totalled 94,165 (special attention was given to the vaccination and re-vaccination of Police and their families in the Northern Settlement).

(*h*) The Assistant Health Officer, Penang, was on leave for part of the year and the Chief Sanitary Inspector was largely in charge of anti-mosquito work in the rural areas in Penang while in other districts this was in charge of the respective Medical Officers. In Penang, the Health Branch during the year took over charge of the maintenance of permanent anti-mosquito work, and the carrying out of fresh work.

At Lumut, the Assistant Engineer, Public Works Department, put up a scheme for dealing permanently with Ravine No. 1, and a special sum was voted for this work.

(*i*) It is hoped to increase the staff for purely anti-mosquito work before long and in addition establish a Rural Health Depôt in Penang, which will form a centre for all Rural Health activities on the Island. A small Health work centre for the Dindings at Lumut is also required.

(*j*) All the rural districts were affected by an exceptional wave of sickness which reached a peak in the month of May. This was an experience common to the whole peninsula and was associated with a phenomenally low rainfall during the first half of the year. The cause of the increased sickness rate can hardly be ascribed as entirely due to an increase in malaria. In Penang, the number of mosquito breeding places was largely reduced and many areas which ordinarily show hill seepage were dry. Where the reduced number of such breeding places could not be, or was not, satisfactorily dealt with then undoubtedly malaria predominated but the cause must rather be sought in the lowered resistance to infection of any sort which the trying meteorological conditions engendered and induced. At the village and district of Lumut where mosquito breeding grounds may be said to be satisfactorily controlled there was no actual increase in malaria, as shown by the admissions to Hospital, whereas there was a large increase in the incidence of other diseases of a non-malarial origin: the same was experienced in some other parts of the Northern Settlement.

It is possible, however, that coincident with the reduction of mosquito breeding places, some species, which are not recognised as carrying malaria under more normal conditions, developed or acquired that faculty under the conditions produced by a constantly high temperature and the comparatively dry atmosphere prevailing over several months.

In areas where breeding places existed conditions as regards malaria grew progressively worse owing to a combination of circumstances which resulted in a large number of infected or gamete—carrying individuals being produced, acting as hosts of the mosquito vector. Some evidence of this was furnished by the Kampong to Kampong surveys made during the worst months in the Districts around Balik Pulau in Penang and Kampong Acheh in Province Wellesley.

(*k*) The year was also exceptional as regards Port work, and the Port Health Specialist had to be given extra assistance during several months of the year. This was largely due to the heavy incidence of cholera in Siam which reached a peak in May in Bangkok, and in South Siam about two months later. This, in addition to other precautions necessitated the inspection of 430 smaller vessels above the number usually examined. These precautions ended in September. In addition to this the number of Indian Immigrants arriving at Penang was nearly doubled, and this threw a lot of extra work on the Department.

(*l*) The total number of persons admitted to the Quarantine Station, 85,607, was the second highest on record. During 1911, a "boom" year, 134,957 persons were admitted. This was due to the large number of Indian Immigrants arriving in the country. A corrected table is attached showing the work of the Quarantine Station during the last twenty-two years.

(*m*) In view of the imminent campaign of the Rockefeller Foundation against hookworm disease special attention was directed to village sanitation and the Rural Boards put forward for the 1927 Budget a large proportion of public health works. Through the efforts of the respective District Officers a proper conservancy scheme for four village areas in Province Wellesley was established and has already come into operation. With this back lanes are being gradually put in and type latrines built in proper alignment.

(*n*) The usual inspection of schools was carried out by the responsible officers. The improvement in the pupils, in their interest and bearing since the institution of systematic physical training under the general supervision of the Instructor, was very noticeable. A survey of all the vernacular schools was made to determine what latrine accommodation was available and required and whether a safe water supply was provided. Action, based on this report will be taken.

Six thousand two hundred and eighty-six anti-hookworm treatments were carried out in the schools: this work will be carried out in 1927 by the Rockefeller Campaign.

Only a modified value can be attached to school spleen rates as shown for the year. In Penang the Assistant Health Officer altered his method of examination to include all spleens palpable on deep inspiration and therefore his findings cannot be compared with those of the previous year unless, perhaps, a matter of 20 per cent is excluded from the 1926 totals. In Province Wellesley, South, and at Lumut the Acting Medical Officer and the Assistant Medical Officer respectively also employed the "deep inspiration" method which is, of course, the routine clinical and hospital method which would ordinarily be adopted by a Medical Officer.

This method is impracticable for Kampong work, for obvious reasons and is not the method adopted by the great majority of anti-malarial workers in this country. Most workers have for years taken the palpable spleens without the aid of deep inspiration and although this may not give a correct index of the amount of malaria in any district, it certainly furnishes an index which is readily acquired even by an unskilled worker and one which is comparable with similar rates elsewhere. Special mosquito surveys were carried out where the spleen rates were high and where there was an undoubted increase in malaria as, for example, in the Balik Pulau District in Penang and Sungei Acheh District in Province Wellesley.

(*o*) Some attempt was made to obtain better Health returns from estates by adding explanatory notes to Schedule "*C*"; there are still a number of inspectable estates which neglect to send in regular returns as required. A list of orders issued on Estates during 1926 is included with the statistical part of the Report, and also a table giving the figures for inspected Estates.

The matter of the modification of, and additions to, the official type plans for estate buildings was gone into with the Deputy Controller of Labour and certain recommendations put forward.

(*p*) Under "Rural Areas" the respective figures for Penang Island as a whole and Penang Island, Rural Areas only, are shown separately, both for 1925 and 1926.

(*q*) The usual returns are attached to the statistical part of this report.

II.—PORT HEALTH WORK

(*a*) Ships, junks, crew units and passengers inspected numbered respectively 538,347, 65,578 and 216,952.

(*b*) Eleven "Pilgrim Ships" carrying 9,218 pilgrims cleared for Jeddah.

Eight "Pilgrim Ships" arrived from Jeddah with 6,637 pilgrims.

(*c*) Seventy-seven ships were "infected Immigrant Ships" with a total of 149,414 Labour Department Indian Immigrants on board.

(*d*) Two hundred and seventy-five were "Chinese Immigrant Ships" a large proportion of the passengers being immigrant coolies from China.

(*e*) Nineteen ships arrived infected with a "dangerous infectious disease" as follows: —

Date of Arrival	Ships	Ports touched at	Infection	Number of cases on board
8–1–26	Teesta ...	Madras and Negapatam	Cholera	17
9–1–26	Seang Bee ...	Amoy, Singapore ...	Cerebro Spinal Meningitis	1
6–2–26	Teesta ...	Madras and Negapatam	Cholera and Small-pox	1 1
18–2–26	Eumaeus ...	Shanghai and Singapore	Small-pox	*a* 1
14–3–26	Takliwa ...	Madras, Negapatam and Port Swettenham	Cholera	*b* 20
28–3–26	Takliwa ...	Madras, Negapatam and Port Swettenham	Small-pox	*b* 1
9–4–26	Ho Sang ...	Calcutta	Cholera	1
17–4–26	Selandia ...	Bangkok and Singapore	Cholera	*a* 1
8–5–26	Tairea ...	Madras, Negapatam and Port Swettenham	Small-pox	*b* 1
16–5–26	Edavana ...	Calcutta and Rangoon	Small-pox	1
28–5–26	Teesta ...	Madras and Negapatam	Cholera	1
20–6–26	Ellora ...	Madras, Negapatam and Port Swettenham	Cholera	3
24–6–26	Dalgoma ...	Negapatam and Port Swettenham	Cholera	2
12–7–26	Talma ...	Calcutta and Rangoon	Cholera	1
13–7–26	Peleus ...	Jeddah	Small-pox	1
14–7–26	Antilochus ...	Jeddah	Cholera	1
31–7–26	Tairea ...	Madras, Negapatam and Port Swettenham	Cerebro spinal Meningitis	1
5–10–26	Takada ...	Calcutta and Rangoon	Cholera	1
31–12–26	Tairea ...	Madras, Negapatam and Port Swettenham	Cholera	1

(*a*) Removed at Singapore (*b*) Removed at Port Swettenham (*f*) The disinfecting launch *Kite* was in use on forty-three occasions.

(*g*) Eighteen corpses were inspected on ships or tongkangs and permits to bury were issued afterwards.

(*h*) Twelve water boats and two storage cisterns supplying the shipping of the port were inspected. Samples of water from each were sent for bacteriological examination and six samples were pronounced unsatisfactory. The boats and cisterns concerned were dealt with, and further samples were obtained which on examination proved to be satisfactory.

(*i*) The following are the statistics of 22 years work at Penang Harbour.

Year	*Vessels*	*Units of Crew and Passengers inspected*
—	—	—
1905	869	214,136
1906	675	204,988
1907	633	219,839
1908	1,205	176,119
1909	503	161,971
1910	526	217,967
1911	1,144	277,151
1912	634	287,373
1913	818	272,473
1914	1,040	215,067
1915	405	148,662
1916	662	213,726
1917	367	203,737
1918	551	173,813
1919	493	210,839
1920	432	207,424
1921	461	197,446
1922	480	197,579
1923	442	182,349
1924	461	214,936
1925	417	203,204
1926	885	282,530
Total	14,103	4,683,329

(j) Nineteen certificates of disinfection and forty-two permits to import, export or tranship coffins containing human remains and 753 Bills of Health were issued. Fees for these amounting to $4,150 were received.

(*k*) "Exemption permits" were issued to 118 ships.

(*l*) "Passenger Undertakings" were issued to 329 Cabin passengers from infected ships: no bonds for this purpose were entered into by relatives or friends of passengers.

(*m*) Cholera was epidemic in Siam during the first nine months of the year. According to the figures received the highest weekly total of cases occurring in Bangkok was 362 in the week ending 22nd May, 1926, while the highest figure for Southern Siam was 279 in the week ending 17th July 1926.

III.—QUARANTINE STATION, PULAU JEREJAK

(*a*) Accommodation is provided for 5,000 persons. The highest total in any one day was 3,912 (in July); the average daily total was 1,447 which compares with 880 in 1925 and 634 in 1924. The station was never empty during the year.

(*b*) From 182 ships 85,607 persons were admitted as compared with 44,984 in 1925.

(*c*) Labour Department Immigrants totalled 60,704.

(*d*) Other Deck-passengers were 24,903 in number.

(*e*) From eighteen infected ships twenty-six cases of dangerous infectious diseases and 12,425 contacts of such were admitted; of the latter 69 developed later the particular disease for which they were quarantined.

Some notes are given below of the occurrence of cholera from such ships.

Twenty-two cases of the latter were admitted of which eleven died and in addition sixty-seven occurred on the station with thirty deaths. Two cases of cholera arose among persons landed from so called non-infected ships, one six days and the other seven days after leaving the last port.

Cholera occurred in a severe form on the s.s. *Teesta* from Madras and Negapatam in January. She reported twenty-three cases on board with seven deaths, and sixty fresh cases from this source occurred at the station.

With regard to small-pox a total of five cases occurred two of which were among passengers off non-infected ships. One of the latter was a case off s.s. *Nam Sang* which arrived at Penang from Calcutta on the 17th May. When small-pox developed vaccination had already been carried out twelve days previously and the patient showed well taken vaccination marks. In spite of this the case was a severe one with a partially confluent rash; this is an exceptional instance of its kind.

(*f*) Altogether four occurrences of the development of a dangerous infectious disease from non-infected ships were noted—two of cholera and two of small-pox. The question of the cholera carriers has to be reckoned with, especially in the case of persons coming from districts which have been heavily infected with cholera over a considerable period.

(*g*) A record of Hospital admissions is shown below:—

Hospital Statistics	*Cases*	*Deaths*
Brights' Disease	5	—
Cerebro Spinal Fever	1	—
Chicken-pox	25	—
Cholera	91	41
The Dysenteries	286	12
Enteritis	141	11
Influenza	324	34
Lobar Pneumonia	31	13
Malaria	334	9
Measles	90	1
Small-pox	5	—
Other diseases	908	29
Total	2241	150

(*h*) At the Dispensary 1,553 attendances were recorded.

(*i*) There were four births on the station.

(*j*) There were 150 deaths during the year among persons landed and thirty-seven of these occurred within 48 hours of landing at the station.

(*k*) Seventy-seven thousand eight hundred and seventy-nine vaccinations were performed with a successful percentage of eighty-four.

(*l*) Anti-hookworm treatment was administered to 55,176 persons. Carbon tetrachloride was used in doses from a half to three c.c. according to age. During the past 3½ years approximately 105,000 persons have been so treated at the station with no untoward result. Infants are excluded and treatment in only given on the third day after arrival.

(*m*) Rainfall totalled 2,389 m.m. over 122 days—the greatest daily fall being 111.5 m.m. on 22nd December.

(*n*) A certain amount of permanent anti-malarial work was completed during the year, and constant supervision from this point of view was maintained. The health of the staff was good and no fresh cases of malaria among them or their families developed.

(*o*) Dr. P Mehta continued to be in charge.

(*p*) A corrected and amended table is given showing the work carried out at the Quarantine Station during the past twenty-two years.

Years	Total admitted	Average daily number of inmates	Cases of Cerebro Spinal Fever	Cases of Cholera	Cases of Influenza	Cases of Plague	Cases of Small-pox	Vaccinations performed
1905 ...	10,406	171	...	1	...	...	10	No record
1906 ...	23,288	461	...	8	...	2	16	6,490
1907 ...	17,650	116	...	24	...	1	4	5,652
1908 ...	21,175	366	...	9	...	2	51	5,691
1909 ...	23,058	359	...	2	...	1	25	5,614
1910 ...	71,876	1,584	...	33	...	2	62	12,205
1911 ...	134,957	3,470	...	387	...	1	109	73,988
1912 ...	55,493	1,111	...	4	...	4	75	38,297
1913 ...	53,937	120	...	12	...	1	11	37,276
1914 ...	48,399	116	...	9	...	...	171	32,606
1915 ...	23,176	478	...	...	...	...	3	21,542
1916 ...	42,736	817	...	1	8	...	11	36,806
1917 ...	37,595	820	...	12	...	...	11	36,808
1918 ...	33,481	720	...	80	64	...	7	29,536
1919 ...	50,733	1,189	...	264	528	...	6	39,941
1920 ...	43,733	932	...	8	559	...	4	41,230
1921 ...	19,653	353	...	3	39	...	42	10,377
1922 ..	31,247	567	...	...	152	...	6	26,675
1923 ...	24,129	479	...	9	84	...	2	23,359
1924 ...	28,701	634	...	151	171	...	...	25,779
1925 ...	44,984	880	5	47	284	...	8	42,514
1926 ...	85,607	1,447	1	89	324	...	5	77,879
Total ...	926,014	17,190	6	1,153	2,213	14	639	630,265

IV. LEPER SETTLEMENT, PULAU JEREJAK

(*a*) *Inmates.*—The general health has been good.

Remaining on 31st December, 1925

Colonial	388	703
Perak	172	
Selangor	89	
Kedah	54	

Admitted during 1926

Colonial	104	147
Perak	17	
Selangor	2	
Kedah	24	
Total treated		850

Discharged 1926

Colonial	4

These were 4 Chinese who were concerned in the murder of 1924; they were deported to China.

Absconded 1926

Colonial	16	22
Kedah	2	
Perak	2	
Selangor	2	

Deaths 1926

Colonial	71	117
Perak	25	
Selangor	13	
Kedah	8	

Remaining on 31st December, 1926

Colonial	401	707
Perak	162	
Selangor	76	
Kedah	68	

The total number of beds is 786. Of these sixty are hospital beds.

The daily average number present was 700·46 as compared with 646·71 of 1925.

There were 39 voluntary admissions.

Of the 147 admitted 99 were advanced cases.

(*b*) Of six hundred and eighty-one cases, who accepted treatment on modern lines, seventy-two per cent (four hundred and ninety cases) were of the advanced type. A full report on treatment is forwarded by the Deputy Medical Officer.

(APPENDIX *B*)

STATISTICS OF TREATMENT BY MODERN LINES

Year	Lepers present	Under treatment	Apparently cured	Definitely improved
1921 ...	655	133	1	16
1922 ...	699	357	1	19
1923 ...	688	456	2	21
1924 ...	726	528	1	33
1925 ...	831	636	3	40
1926 ...	* 850	* 681	7	106

* Including those carried forward from previous years

Of the 106 who definitely improved during 1926 ten have lost all external clinical signs of Leprosy, but are still positive to Lepra bacilli.

(*c*) The following figures show the result of treatment on the death-rate, in which there has been a steady decrease.

				Number of deaths	*Percentage of deaths to total treated*
1921	Remained	438	655	201	30·68%
	Admitted	217			
1922	Remained	450	699	186	26·06%
	Admitted	249			
1923	Remained	498	688	140	20·34%
	Admitted	190			
1924	Remained	539	726	130	17·09%
	Admitted	187			
1925	Remained	584	831	117	14·00%
	Admitted	247			
1926	Remained	703	850	117	13·76%
	Admitted	117			

(*d*) Anti-malarial work has been carried out regularly; there have been no fresh cases of malaria. Subsoil pipes were laid down at Camp E. Seven hundred and eighty gallons of oil were used for anti-malarial purposes.

(*e*) The total rainfall was 2,419 m.m. The number of rainfall days was 152. The maximum fall on one day was 110 m.m. on 18th June, 1926.

(*f*) Owing to the severe drought, the water supply was very deficient and 8,264 tons of fresh water brought from Penang by water boat. The Green Bank reservoir has been further improved by extending the binding on the dam wall by six feet. The reservoir at Camp E is still under construction; the dam has been completed but the inside basin is being cemented.

(*g*) *Buildings.*—All the wards at the old station have been painted white inside and this has improved the lighting considerably; the insides of the roof have also been whitewashed, this work being done by the lepers.

The old magazine was converted into a dwelling-house for the inmates in charge of the piggery.

Wards 1 and 6 have had structural alterations to improve ventilation. A scheme was initiated to provide for extensive additional structural alterations during the current year.

Bathrooms and latrines have been erected at the cells.

Four huts were erected at Camp E, but cannot be occupied until the work on the new reservoir has been completed.

(*h*) Eight corrugated iron incinerators were erected and these have helped to materially improve the sanitary state of the Settlement.

(*i*) Of 100 Hydnocarpus Wightiana seeds planted, 70 germinated and of this number 20 are in flourishing condition.

(*j*) The piggery which was started with one carrying sow in 1925 has proved a success. There were further litters, bringing the total up to 24.

(*k*) The Boy Scout patrol of twelve boys continues, and the brass band started at the end of 1925 under the tuition of a Filipino inmate has greatly improved: a band stand has been erected at the Eurasian Camp.

(*l*) Tuition has been regularly given to 18 boys in Chinese and English.

(*m*) The vegetable gardens continue to be successfully worked by the inmates.

(*n*) At Chinese New Year each inmate received the usual gift of twenty-five cents.

(*o*) Special attention was directed towards the improvement of sanitation of the wards and Settlement generally.

(*p*) Dr. A. H. WHEATLEY remained in charge of the Leper Settlement; the health of the staff was good throughout the year.

(*q*) The Municipality of Penang kindly presented three brass instruments to the band, and Mr. CHEAH LEONG KEOK of Penang presented three gramophones.

V. RURAL AREAS

(*a*) Vital Statistics for the Settlement are given for 1925 and 1926: the figures for Penang Island including the Municipality are also shown

VITAL STATISTICS FOR PENÁNG SETTLEMENT FOR 1925 AND 1926

—	Year	Estimated population	Total Births	Birth rate per mille	Total Deaths	Death rate per mille	Total malarial deaths	Malarial death rate per mille	Total deaths of infants under one year	Infantile death rate per mille, Births
Penang Island (including Municipality) ...	1925 1926	173,217 176,126	5,783 5.923	33·39 33·63	5,201 6,046	30·02 34·82	... ...	... ...	912 1,056	157·70 178·28
Penang Island Rural Areas*	1925 1926	39,844 41,022	1,465 1,495	36·77 36·44	1,404† 1,616	35·24 39·39	477 702	11·97 17·11	196 242	139·79 161·87
Province Wellesley ...	1925 1926	131,577 131,930	4,374 4,557	33·24 34·54	3,733 4,250	28·38 32·21	1,372 1,783	10·42 13·51	615 624	140·60 136·93
Dindings	1925 1926	15,185 16,260	433 473	28·51 29·03	342 476	22·52 29·29	123 173	8·10 10·63	68 97	157·94 205·07
All Rural Areas of the Settlement	1925 1926	186,606 189,212	6.272 6,525	33·61 34·48	5,181 6,342	29·37 33·51	1,972 2,657	10·56 14·04	879 963	140·15 147·58

* The figures for Pulau Jerejak Leper Settlement and Quarantine Station not included with these

† One hundred of these deaths occurred in the Government Hospitals within town limits

(*b*) There was no occurrence of a dangerous infectious disease within the rural areas of the Settlement.

(*c*) The following shows the total of vaccinations performed including those carried out at the Quarantine Station.

VACCINATIONS IN PENANG SETTLEMENT DURING 1926

—	Number of Vaccinations performed	Percentage of successful results seen	Numbers not seen
Penang Island	11,347	82 21	1,261
Province Wellesley	3,952	87.17	266
Dindings	987	47.31	320
Quarantine Station Pulau Jerejak ...	77,879	84.00	...
Total ...	94,165	83.52	...

(*d*) A separate report has been put in regarding the treatment of Yaws—the total number of injections given by the Rural Health Officer in Penang Island over a period of eight months was 1,704.

(*e*) At the Penang Hills Dispensary, which is in charge of the Health Branch, the number of persons treated was 1,719 with total attendances amounting to 6,893.

(*f*) In all districts a considerable advance in sanitation was made. In Province Wellesley special attention was given to dairies in the Northern and Central districts and a number of notices to affect improvements in one area were issued by the Rural Board.

In both the Central and Southern districts the efforts of the respective District Officers resulted in much good work being done to improve sanitation generally and to establish a proper system of conservancy in the villages.

(*g*) The reservoir at Bukit Panchor was treated with copper sulphate in September and again a month later.

(*h*) School work and anti-mosquito work carried out in the Rural areas are both dealt with separately.

(*i*) A detailed report on the sanitary state of the Northern Settlement was put in during the year.

(*j*) Dr. D. C. RICHARDS continued to officiate as Health Officer, Rural areas, Penang, except for a period of 4 months when he was on leave.

VII.—SUMMARY OF ANTI-MOSQUITO WORK CARRIED OUT IN 1926

1.—PENANG

(*a*) Different permanent works were carried forward from the previous year; from August all such permanent work and maintenance in Penang was carried out by the Health Branch

The Chief Sanitary Inspector was the chief executive officer in charge, and the permanent staff consisted of five overseers and 68 oiling and other coolies and one mason; additional coolies were taken on as required.

A mosquito inspector carried out weekly or fortnightly surveys all over the Island and on Pulau Jerejak. The sanitary inspectors supervised the work carried out in their districts.

(*b*) A list of permanent work done during the year is summarised below—

Place		*Buried drains chains*	*Open concrete drains chains*
Aier Etam (and surroundings)	...	114¼	22¼
Waterfall Gardens ...	...	18¼	—
Sungei Glugor (Marine Depôt)	...	63¼	—
Sungei Nibong Police Station	...	5½	—
Tanjong Tokong ...	...	20	—
Tanjong Bungah ...	...	⅓	—
Pulau Jerejak (Camp E.)	...	17¼	—
Total	...	238⅚	22¼

(*c*) Temporary measures, oiling and ditching, were carried out regularly over about 20 different arreas. On Penang Island 46,585 gallons of oil were used at a cost of approximately $15,700 with transport $1,700 and labour $8,250; the latter item, however, also includes the cost of ditching and cleaning drains. On Pulau Jerejak 975 gallons of oil were employed; the total amount spent on temporary anti-malarial work there was $1,364.40. At Waterfall Gardens where oiling would tend to deface the natural beauty of the site Paris Green (Copper Aceto Arsenite) was again successfully employed.

(*d*) The result of all this work is difficult to estimate as the year was a bad one from a health point of view but some figures may be given applying to certain districts.

The deaths on account of malaria registered at Aier Etam for the last three years are as follows:—

1924	... ...	123 deaths
1925	... ...	115 ,,
1926	... ...	95 ,,

In the Jelutong district which might be affected by the Sungei Glugor work they were:—

1924	... ...	48 deaths
1925	... ...	38 ,,
1926	... ...	33 ,,

In spite of the bad year there was no special increase in deaths from malaria in the following districts.

Year		*Tanjong Tokong*	*Batu Ferringhi*	*Sungei Nibong*	*Bayan Lepas*
1924	...	118	51	75	154
1925	...	121	55	84	149
1926	...	123	52	88	151

In any case large numbers of dangerous anopheline breeding places were eliminated or controlled.

On the other hand a table is appended showing how, in certain districts, there was a very definite increase in the incidence of malaria on Penang Island.

MONTH	SUNGEI PINANG				PULAU BETONG				BALIK PULAU KONGSI			
	1925		1926		1925		1926		1925		1926	
	Total Deaths	Malarial Deaths	Total Deaths	Malarial Deaths	Total Deaths	Malarial Deaths	Total Deaths	Malarial Deaths	Total Deaths	Malarial Deaths	Total Deaths	Malarial Deaths
January	8	3	14	4	6	1	5	2	19	10	19	9
February	5	2	15	9	4	2	6	3	21	8	19	3
March	12	6	20	10	1	...	22	13	15	10	15	9
April	8	5	25	5	4	3	8	6	15	7	28	12
May	13	4	35	16	9	3	17	9	21	4	45	17
June	9	6	28	10	8	2	12	4	16	10	37	23
July	11	4	10	4	5	3	9	4	15	6	29	17
August	7	3	15	8	8	2	5	3	14	4	25	13
September ...	9	2	18	10	9	4	4	2	9	2	22	8
October	13	7	14	6	2	...	6	2	12	5	24	16
November ...	17	5	7	1	8	4	5	3	27	8	16	8
December ...	9	3	6	4	8	2	9	3	25	12	15	7
TOTAL ...	121	50	207	87	72	26	108	54	209	86	294	142

A special dresser was sent out to visit the Kampongs in these districts during June and July. He treated some 400 cases of fever and other sickness and found that out of 116 blood films taken 64 per cent showed infection with malaria.

(*e*) The Municipality, from the first of April, carried out all anti-mosquito measures within a radius of half a mile from the lines housing coolies employed on the new water extension scheme, with excellent results.

(*f*) In addition to his regular work special mosquito surveys of the following villages were made by the mosquito inspector: Relau, Sungei Ara, Bayan Lepas, Telok Kumbar Sungei Pinang, and 49 visits were made to Pulau Jerejak. In addition he carried out the following special surveys in Province Wellesley, at Kepala Batas, Bukit Tengah, Bukit Tambun, Simpang Ampat and Sungei Acheh district. He was also sent to Lumut to conduct a special check survey there.

(*g*) The different species of anophelines recovered are shown below according to the relative frequency of their occurrence.

Species	*Approximate ratio per cent.*
A. maculatus	27·0
A. barbirostris	27·0
A. vagus	17·0
A. hyrcanus vel sinensis	13·0
A. leucosphyrus	11·0
A. kochi	5·0
A. separatus	1·4
A. aconitus	1·1
A. aitkeni	0·6
A. subpictus var malayensis	0·4
A. umbrosus	0·3
A. karwari	0·1
A. ludlowi	0·1

II.—PROVINCE WELLESLEY

(*h*) Permanent work was carried out here by the P W. D. with the exception of some draining at Penaga Wireless station carried out by the Medical Officer.

BUTTERWORTH.—Fifty chains of earth drain were made, 27 chains cement drain laid, and 3,500 cubic yards of filling was completed for anti-malarial purposes.

BUKIT MERTAJAM.—Thirty chains earth drain made and a considerable amount of filling in on private land.

No permanent work was done in the Southern District.

(*i*) Temporary measures, including oiling and ditching, were carried out at the following places—Penaga Wireless Station, Butterworth, Bukit Mertajam, Prai, Sungei Bakap, Nibong Tebal, Bukit Tambun, and Simpang Ampat. Ten thousand four hundred and fifty-two gollons of oil was used in Province Wellesley for these purposes, and the cost with transport and labour, which involved a large amount of ditching and cleaning of drains, amounted to $7,167.

(*j*) The comparative figures for malaria in certain districts are given below.

	1925		*1926*	
Deaths Registered at	*Deaths In villages*	*Outside village areas*	*Deaths In villages*	*Outside village area*
*Sungei Bakap ...	26	71	29	107
Nibong Tebal ...	41	131	39	177
Bukit Tambun ...	41	29	18	42
Simpang Ampat ...	10	29	16	43

The lowered rate at Bukit Tambun village may fairly be attributed to the oiling carried out by the medical officer there. Very few breeding places of dangerous anophelines could be found by the mosquito inspector at his different visits to make check surveys.

(*k*) The following table shows the admissions and deaths at Sungei Bakap Hospital on account of malaria.

	1925		*1926*	
Places.	*Admissions*	*Deaths*	*Admissions*	*Deaths*
Village areas ...	221	14	187	15
Outside village areas, including cases from estates ...	333	15	531	31

There was a large increase in malaria in the Sungei Acheh district: the mosquito carrier was possibly A. ludlowi.

III.—LUMUT

(1) Maintenance of completed anti-malarial work was taken over by the mosquito collecor for the last half of the year: he was advised by the

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* Excluding deaths registered at the Hospital

assistant engineer as required. An average of about 36 coolies was employed permanently on maintenance. About twelve chains of buried drain were relaid or replaced in the ravines. The grass in ravines 2 to 9 (both included) was cut regularly and kept close cut throughout the year.

Ravine No. 1 was taken in hand and a survey and scheme for permanent drainage put up by the assistant engineer—it was not possible to commence this work till the last week of the year.

(*m*) Oiling was carried out regularly at Lumut—the combined cost of this with maintenance of the ravine drainage during the last six months of the year averaged $760 per mensem; the amount of oil consumption per month averaged 170 gallons.

(*n*) The species of anophelines recovered by the mosquito collector at his weekly surveys is shown below in the order of frequency of the occurrence of each.

Species	*Approximate ratio per cent found*
—	—
A. aitkeni	33·5
A. maculatus	20·5
A. barbirostris	20·0
A. karwari	10·2
A. leucosphyrus	7·2
A. vagus	6·1
A. fuliginosus	1·2
A. kochi	0·8
A. hyrcanus	0·5

A. aitkeni is a typical jungle stream breeder and was recovered from the feeders of the reservoirs: it is not known to carry malaria.

(*o*) There was considerable trouble with the two reservoirs during the drought when they were both low and found constantly to breed A. maculatus. With plenty of water and the edges clean this does not happen. In Ravines, Nos: 4 and 5 A. maculatus breeding places were created (1) in one case from an earth well and (2) from a dammed up drain, both measures adopted during the shortage of water: this happened during the month of May and resulted at once in the small outbreak of malaria.

(*p*) Regular oiling was carried out at the Public Works Department quarry at Segari with good results.

(*q*) A return prepared by the assistant medical officer indicating the incidence of malaria in drained and undrained areas in Lumut is attached.

(*r*) About 200 chains of open drain were made at Sandycroft Estate and towards the Bruas River for anti-malarial purposes under the supervision of the Assistant Engineer.

(*s*) The total amount spent on anti-malarial work in the northern settlement during the year was $75,229.94. In addition there was a vote of $5,000 maintenance at Lumut which was expended. An additional vote of $20,000 was asked for and approved for certain specific works, but owing to a variety of circumstances only a small amount of this vote could be spent, and it will be available during the current year.

(*t*) Sir Ronald Ross visited some of the work being carried out in Penang during December, and expressed his approval of what he saw.

VIII. ESTATE WORK

(*a*) The number of visits made to estates by officers of the Health Branch totalled 222.

(*b*) Vital statistics for the estates for which figures are available are given below. Analysis of this table shows the high proportion of deaths among dependents and the excessive number of deaths which occur outside any hospital.

VITAL STATISTICS OF ESTATES IN NORTHERN SETTLEMENT FOR WHICH FIGURES ARE AVAILABLE

SITUATION	Total of Estates	Total Acreage	POPULATION				BIRTHS			DEATHS							Death-rate per mille	Death-rate among Labourers only	INFANT DEATHS UNDER 1 YEAR
			Labourers	Dependents		Total				In Hospital			Outside Hospital						
				Adults	Children		In Hospital	In Lines	Birth-rate per mille	Labourers	Dependents	Total	Labourers	Dependents	Total	Grand Total			TOTAL *
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Penang ...	30	15,630	731	186	...	917	...	...	...	3	...	3	4	6	10	13	14·17	9·59	...
North Province Wellesley ...	21	22,000	5,867	400	1,820	8,087	2	131	22·66	20	10	30	72	40	112	142	16·32	15·68	25
South Province Wellesley ...	62	35,640	6,525	500	2,302	9,327		202	30·95	36	24	60	109	46	155	215	23·05	20·68	42
Dindings ...	22	10,003	2,600	25	568	3,243	36	54	34·61	21	35	56	5	19	24	80	24·60	10·00	23
Summary ...	135	83,273	15,723	1,164	4,690	21,574	38	387	20·67	80	69	149	190	111	301	450	20·85	17·17	90

* Also included in column 17

(*c*) A list of orders issued on estates is also given; although a number of the orders were not satisfactorily completed by the end of the year, in every case action is being taken. Orders to employ dressers can only be made in accordance with the supply available. There is a great shortage of competent dressers and a considerable number of those employed hold no Government qualification.

Orders issued on Estates in Penang, Province Wellesley and Dindings on the recommendation of, or by, the Senior Health Officer, Penang, during 1926.

Natre of orders issued	*Number of orders issued*	*Number of orders satisfied by 31st December, 1926*
Penang Island.		
To construct permanent lines	5	0
To make protected wells	3	2
To provide piped water service	2	2
To erect permanent pail latrines ...	12	7
To make trench latrines	2	0
	24	11
Province Wellesley		
To engage visiting medical practitioners ...	9	5
To employ resident dressers	4	3
To share dressers	7	3
To construct permanent lines	1	1
To make protected wells	2	2
To erect permanent pail latrines ...	3	3
To make trench latrines	1	1
	27	18
Dindings		
To engage visiting medical practitioners ...	1	1
To employ resident dressers	2	1
To construct permanent cooly lines ...	5	2
To erect permanent pail latrines ...	4	2
To make protected wells	6	1
To stock drugs	1	1
	19	10

(*d*) A summary of the admissions and death-rates for estate hospitals in Province Wellesley is shown below:—

Total of six Estate Hospitals	*Number of admissions*	**Number of deaths*	*Percentage Death-rate on admissions to Estate Hospitals*
—	3,985	125	3·13

A. G. H. SMART,

Acting Senior Health Officer, Penang.

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* Deaths outside Hospital not shown

MALACCA

By S. W. Eveson, M.R.C.S., L.R.C.P.

Health Officer, Malacca

(1) I arrived in the Settlement on 12th February, 1926 and took over the duties of Health Officer from Dr. J. W. Scharff on 25th March, 1926.

(2) The duties of Health Officer, Malacca are:

(*a*) Health Officer, Municipality.

(*b*) Health Officer, Rural Area.

(*c*) Medical Officer, Schools, Malacca.

This report deals with the Rural Area (unless otherwise stated). This area consists of 716·5 square miles with an estimated population of 146,992.

(3) Staff: —

Seven Sanitary Inspectors:

One was lent to the Director of the Straits Rural Sanitation Campaign; another is paid for out of the Government Hookworm and Sanitation Vote, and is attached to the Health Unit, Jasin.

(4) The Rural Area is divided into the following districts each under the charge of a Sanitary Inspector.

1. Central
2. Merlimau
3. Jasin
4. Asahan
5. Alor Gajah
6. Sungei Bharu

(5) Statistics for whole Settlement, including Municipality for years 1922—1926, inclusive.

Year	Estimated Population	Deaths	Death-rate	Births	Birth-rate	Infantile Mortality
1922 ...	157,240	4,128	26.25	4,992	31.75	225.96
1923 ...	160,886	4,341	26 93	5,461	33.95	258.70
1924 ...	170,294	4,299	25.24	5,834	34.26	253.34
1925 ...	177,010	4,046	22.85	5,798	32.76	226.46
1926 ...	184,437	5,606	30.40	6,640	36.00	268 22

The Deaths and the Infant Mortality Rate show a marked increase for 1926, and the main cause for this increase is clearly shown by comparing deaths from Malaria, Convulsions, and Fever unspecified for the years 1925 and 1926.

Year	*Malaria*	*Fever Unspecified*	*Convulsions*	*Total*
—	—	—	—	—
1925 ...	1,111	264	1,114	2,489
1926 ...	1,723	285	1,442	3,455

These three causes will be seen to account for over half the total deaths. The total number of deaths and those for Malaria, Convulsions, and Fever unspecified were highest in May and July.

The Malaria cases admitted to hospitals numbered 2,659 for 1926 as compared with 1,129 for 1925.

(6) Infectious Diseases:—

No cases of Cholera, Plague or C. S. M. occurred.

Small-pox—2 cases occurred. The source of infection was traced to Johore.

Leprosy —20 cases were dealt with during 1926.
12 cases were sent to asylum.
6 cases—isolated in houses.
2 died.

Erysipelas— 2 cases

Chicken-pox—20 cases.

Diphtheria—9 cases—2 deaths.

Gonorrhœal Ophthalmia—An epidemic of Gonorrhœal Ophthalmia among rickshaw pullers occurred in the Town. Two hundred and one cases were isolated and treated in the Isolation Camp.

(7) General Sanitation—

Under this heading the Rural Area can be divided into—
(*a*) Village Areas.
(*b*) Kampongs.
(*c*) Rubber Estates.
(*d*) Government Buildings.

(*a*) *Village Areas.*—

There are 22 village areas in Malacca. Five new villages were created during 1926. Four villages had a night-soil removal system introduced, making a total of seven. Scavenging under the supervision of the Rural Board, Malacca, takes place in all the villages.

All villages are supplied with incinerators. These are not satisfactory and a special vote has been made for their replacement.

Two new markets were built during the year making a total of three.

Anti-malarial work was carried in six villages by the Health Branch.

Votes by Rural Board for 1926.—

(1) Dollars Three thousand for provision of two public latrines; one is in course of construction at Jasin.
(2) Dollars Twenty-five thousand for provision of permanent drainage where necessary.
(3) Dollars Twenty thousand for provision of markets.
(4) Dollars Five thousand four hundred and fifty for provision of new incinerators.

(*b*) *Kampongs.*—Anti-malarial work was carried out in Limbongan Kampong. In most of the Kampongs a demonstration pit latrine was installed. Limbongan and Ujong Pasir were made demonstration areas, and all the houses in the former have sanitary latrines.

(*c*) *Rubber Estates.*—One hundred and ten visits were paid to European, Chetty, and Chinese Estates. Two hundred latrines were installed on Estates during 1926. Seventeen orders were given to estates by the Controller of Labour on recommendations by the Health Officer to improve conditions. The latter also made 4 orders on the recommendation of the Malacca Agricultural Medical Board New anti-malarial drainage works were carried out successfully on six estates.

Estate Hospitals.—There are 27 estate hospitals and 3 sick lines in Malacca.

(*d*) *Government Buildings.*—A sanitary survey was made of 182 Government buildings (exclusive of European quarters) in Malacca during the year.

As a result of this survey it was estimated that 436 latrines were required.

Votes for Latrines.—Dollars Fourteen thousand three hundred and ninety was voted by Government for provision of 286 latrines in vernacular schools.

Dollare Two thousand five hundred was voted by the rural board for provision of 50 latrines in P. W. D. coolie lines.

The Health Branch undertook the construction of these.

(8) *Straits Rural Sanitation Campaign.*—A Government vote of $16,000 was made for 1926, and an endeavour was made to sanitate Malacca in conjunction with the Rockefeller International Health Board representative, Dr. RUSSELL.

The total number of latrines, mostly of the Baeza type, constructed in the Rural Area during 1926 was 490. Two hundred of these were put up by estates.

The information regarding estates was obtained as the result of sending copies of a circular letter to 100 estates asking for this figure and also advocating the use of small bucket latrines for children near the lines. There were 56 replies.

(9) *Anti-mosquito Work.*—For this work $30,000 was voted for 1926.

There is an annual recurrent vote of $3,000 for oiling.

A. *Staff.*—	1	Mosquito Inspector
	5	Overseers
	7	Mandores
	150	Coolies.
	1	Lorry Driver
	1	Cleaner.

(A lorry was purchased for conveying coolies, oil and materials to different parts of the Settlement).

B. In connection with this work 110 mosquito surveys were made and breeding places of the following anopheline mosquitoes located.

A. Maculatus
A. Karwari
A. Ludlowi
A. Umbrosus
A. Tesselatus
A. Fuliginosus
A. Sinensis
A. Vagus
A. Kochi
A. Rossi
A. Barbirostris.

Anti-malarial work was carried out in six villages and three kampongs. Oiling was done in three villages and the Tampin authorities oiled drainage works at Pulau Sebang.

No permanent drainage work was undertaken. Amount of vote spent $27,600.

(10) *Water Analysis.*—Twenty-two samples were taken from streams, public and private wells. Of these 12 were found to be potable.

(11) *Dairies.*—The seven dairies in the Rural area were inspected and improvements carried out in each.

Samples of milk were examined with the following results.

Analyses	44
Prosecutions ...	4

Anti-malarial work is being carried out at Kemuning, Ganun and Pulau Sebang. Temporary latrines were provided at 7 vernacular schools.

(12) *Exhibits.*—Two health exhibits were made during the year, one in connection with the Horticultural Show and the other with the opening of the Health Unit. There is a permanent health exhibit in Jasin Hospital.

(13) *Infant Welfare Work.*—A new clinic was started by the Medical Mission at Merlimau. The first Baby Show we held in Malacca took place on 25th September. Nearly 100 babies of all nationalities from the whole Settlement competed and many money prizes were awarded.

S. W. EVESON,
Health Officer, Malacca.

School Hygiene

There are in the Colony about 50,000 children of school age. The medical and health control of the schools is vested in the Government Health Branch.

In Singapore an Assistant Health Officer examined 5,338 boys against 2,791 in 1925. The Lady Health Officer examined 2,586 girls, most of them twice.

In Penang Settlement (including Province Wellesley and Dindings) 7,956 boys and girls were examined.

In Malacca 6,520 boys were examined.

The cleanliness and general nutrition of the children are improving.

Dental defects in the towns show no signs of diminishing but more children are being sent to dentists. Details of School Hygiene are given in Appendix *K*.

HOUSING AND TOWN PLANNING

The working out of Improvement Schemes in the Municipalities of Singapore, Penang and Malacca, is further advanced and the necessary land is being acquired and laid out.

A sum of ten million dollars has been appropriated for the scheme in Singapore

An Ordinance to provide for the improvement and development of towns and other areas was before the Legislative Council at the end of the year and has since been passed.

The overcrowding in parts of all the Municipal areas is acute.

MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION

A health Exhibition was held in connection with the Malacca Agri-horticultural Show: it included sections on Hook-worm and other intestinal worm infection; Malaria; Infant Welfare and Maternal Hygiene; Tuberculosis, Yaws and Venereal Diseases.

In December, a Health Centre was opened at Jasin Hospital in Malacca, and a permanent health exhibit has since been installed there.

All the Penghulus and most of the Chinese Towkays in the District were present, and there was a very large attendance of Malay families.

The Resident Councillor, Malacca, presided.

Baby Shows were held during the year in both Singapore and Malacca; model *layettes* were shown and methods of feeding were demonstrated.

Dr. MILFORD BARNES and Dr. PAUL RUSSELL of the International Health Division of the Rockefeller Foundation have been most active, the former until he returned to the United States in July, and the latter throughout the year, in lecturing on and demonstrating the causes and prevention of Ankylostomiasis and other bowel diseases. Several pamphlets were issued and many cinema and lantern demonstrations given by them.

TRAINING OF SANITARY PERSONNEL

The sanitary inspector is to a Health Service what a sergeant is to the army, its backbone. On him depends the daily routine for carrying out health duties.

With the development of rural sanitary work, it became obvious in 1921 that the Government should have a proper staff of sanitary inspectors. A lecture-room, small museum and various offices and store were fitted out at Jalan Klapa. The collaboration of the Royal Sanitary Institute of London was fortunately obtained; and, in accordance with its practice in suitable tropical centres, the Institute agreed that students locally trained on an approved schedule, should be able to obtain the Sanitary Inspector's Diploma of the London Institute after an examination by an approved Board of Examiners in co-operation with the Government of the Straits Settlements. This facility was much appreciated, for it meant that not only the comparatively few students destined for Government services would be catered for, but, at the same time, without much expenditure, members of the public might be admitted to the course on payment of the necessary fees. The school has throughout been under the charge of Dr. GILBERT BROOKE. The first session began in May 1921, and was attended by five selected candidates for Government Service.

In 1922, 7 candidates attended the second session, of whom three were successful at its conclusion. In 1923, ten students attended the course, of whom three passed; in 1926, 26 students attended the course; the successful ones numbered eleven. A fifth training took place in 1925. The number of candidates amounted to the large total of 43, of whom 36 sat for the Royal Sanitary Institute Examination. Twelve candidates were successful in obtaining the diploma after the usual examination in Hygiene, Sanitary Engineering, Veterinary Science, Chemistry and Physics. This class proved too large for successful handling.

The class in 1926 was limited to 26, of whom 20 secured the Diploma.

Professor Bostock Hill inspected the facilities for teaching and was present at the part of the 1926 examination on behalf of the Council of the Royal Sanitary Institute of Great Britain. He declared that the teaching and the standard of examination were adequate.

IV.—KING EDWARD VII COLLEGE OF MEDICINE, SINGAPORE

Electoral Board.—No changes have occurred during the year.

The Council.—The inadequate representation of the Federated Malay States on the Council was corrected by the nomination of the Principal Medical Officer, the Senior Health Officer and the Director of the Government Laboratories, Federated Malay States, as *ex-officio* members by the Chief Secretary, Federated Malay States.

Dr. Chen Su Lan was appointed a member of the Council in succession to Mr. See Tiong Wah who vacated his seat under section 7 of the Ordinance.

Sir David Galloway was appointed, as British Medical Association representative in succession to Dr. M. J. Rattray who resigned his seat on the Council.

Senate.—Dr. J. S. English, Professor of Midwifery, went on leave on February 20th, 1926, and returned on October 24th. During his absence Dr. R. B. MacGregor performed his duties.

Dr. C. J. Smith, Professor of Clinical Surgery, went on leave on February 20th, to attend the International Surgical Congress held this year in Rome. During his absence Mr. K. Black acted for him, and Mr. Black's duties devolved upon Mr. A. D. Wright. On Mr. Smith's return on July 31st, his appointment was changed to Senior Professor of Surgery (part-time) and Mr. Wright was appointed Professor of Clinical Surgery.

Dr. G. A. Finlayson retired on March 31st, from the post of lecturer in Pathology after eighteen years' service. Dr. Finlayson who had always identified himself with the students social activities as well as with their work, will be greatly missed. He was succeeded by Dr. J. C. Tull.

Mr. G. W. Crawford was on leave at the commencement of the year, his duties as lecturer in Pharmacy being performed by Mr. A. J. Turner, Mr. Crawford resigned on March 31st, after 17 years' service. His duties were performed by Mr. F. H. La Mothe from June 1st and August 31st. Mr. A. J. Turner assumed the lecturership in Pharmacy on October 1st.

Professor J. G. Harrower, Professor of Anatomy, departed on leave on April 11th, Dr. J. C. Carson assumed his duties and is still acting as Professor of Anatomy.

Professor J. R. Kay-Mouat, Professor of Physiology, went on leave on April 28th, and returned October 25th. During his absence Dr. G. H. Macalister acted for him as Professor of Physiology and lecturer in Pharmacology. Dr. Kay-Mouat visited Adelaide on August 13th to attend the Jubilee celebrations of the University as a delegate and representative of the College The honorary degree of M.A. was conferred on him.

Dr. A. N. KINGSBURY assumed duty as Professor of Bacteriology on April 30th, the first of the professional chairs endowed by the Rockefeller Foundation to be filled.

Captain K. B. WILLIAMSON was appointed on September 24th, to the Professorship of Biology. The Professorship of Biochemistry was still vacant at the end of the year.

The Principal, Dr. G. H. MACALISTER, proceeded on leave on November, 19th. The duties of Principal were assumed by Professor KAY-MOUAT on the same day. Dr. MACALISTER'S duties as Professor of Clinical Medicine have been assumed by Drs. E. D. LINDOW and V. H. NORRIS. His work as lecturer in Therapeutics is being performed by Dr. NORRIS.

Junior Teaching Staff.—Dr. S. R. SALMON left the College on transfer to Tan Tock Seng's Hospital, Singapore, and was replaced by Dr. C. J. OLIVEIRO on October 31st, as assistant in Ptysiology.

Dr. NORRIS returned from post graduate study in the United States of America on a Rockefeller Foundation Fellowship in October, and resumed his duties on the teaching staff.

Students.—Thirteen students completed their course and passed the final examination for the Diploma of L.M.S. The total number of licentiates at the close of the year was 199.

In December, 102 students were attending the College.

These were distributed thus as regards seniority.

First Year	30
Second Year	29
Third Year	17
Fourth Year	9
Fifth and sixth Year	17
Total	102

Of these 4 are Straits Settlements Government Students, 27 are Federated Malay States Government students, 12 are scholars and 24 are exibitioners.

Discipline.—No serious breaches of discipline have occurred.

Buildings.—The New College of Medicine was opened by His Excellency the Governor on February 15th.

The conversion of the Tan Teck Guan building into the Anatomy School has been effected.

The old general lecture room has been made into a students' recreation room.

The former Physiology and Anatomy laboratories are used as animal houses.

Inspection by General Medical Council.—From December 21st to December 24th Col. R. A. NEEDHAM, C.I.E., D.S.O., visited the College on an official inspection and expressed satisfaction at the standard maintained. He made suggestions for the further improvement of the teaching which he will embody in a later report.

Scientific reports by the Professor of Bacteriology and the Professor of Biology are attached as Appendices *M.* and *N.*

V.—CHILD WELFARE AND MATERNITY WORK

For the population of this Colony of whom a large proportion are uneducated in public health matters and are indifferently housed, child welfare work is of great importance. The annual infantile mortality rate is a delicate index, to the health of the community. In Singapore it was not until 1914 that the rate was ever below 300 although it had even then tended to decline for several years. The first effort to grapple with the situation was in October, 1910, when a municipal nurse was appointed to secure information regarding conditions of the early life of the infants and to advise the mothers. A system of instructing and licensing midwives was also inaugurated by Government and two were so licensed in 1911 after passing an examination. In 1912 a second nurse was appointed by the Municipality; in that year the nurses paid 8,855 visits and saw 3,449 infants, while the midwives delivered 140 cases. The Midwives Ordinance came into force in the Municipality on the 1st of July, 1917.

A new Midwives Ordinance constituting a Central Midwives Board was passed in 1923. Under its rules, registration is now compulsory within the Municipal limits of Singapore, Penang and Malacca, and may be extended to rural areas when circumstances permit. All competent practising midwives were registered when the Ordinance was introduced. Further registration is confined to midwives holding the certificate of the home Central Midwives Board or other satisfactory certificate, or the Diploma or the certificate of our Local Board, for which one year's training, and the passing of an examination of high standard, are essential.

The number of registered midwives at the end of the year was—Singapore 352, Penang 152 and Malacca 28, of whom a few were practising in rural areas.

In the year 1926, 4 European nursing sisters supervised the work of Asiatic midwives in Singapore. The Municipality now has two clinics one at Prinsep Street and one at Kreta Ayer. In each of these a European sister is in charge, and to each 4 Asiatic health visitors are attached.

In all 64,432 consultations were held on 9,286 babies by the Municipal sister and health visitors in Singapore, inclusive of visits to their homes and visits of mothers with infants to clinics.

Eight thousand five hundred and thirty-nine infants were seen at first visits to homes. Of these 6,385 were breastfed, 1,825 were taking tinned milk, and 329 were on mixed feeding.

Of 8,966 mothers visited in Singapore 7,789 were living in cubicles or single rooms.

At the confinements of these mothers—

49 were attended by medical men
28 by A class midwives
6,110 by B class midwives
1,376 by C class midwives
1,028 by friends and
375 were unattended.
8,966

As a supplement to the Municipal work the two Matrons of the Child Welfare Society of Singapore under the presidency of lady GUILLEMARD, saw 12,587 children at their two centres; 43 per cent of these were under one year of age.

About 10,000 infants were visited in their houses by the Society's health visitors.

The total number treated by the Society was nearly double that of the previous year. The Society is mainly supported by public donations, but receives a government grant of $2,000 a year.

A playground for children at the People's Park, equipped by the Municipality, was a great success.

In Malacca Municipality, the health visitors made 23,138 visits to 3,779 infants under the age of six months.

They attended 1,121 new born babies, of whom 326 were bottle fed.

In Penang two European district nurses and 8 Chinese qualified midwives, acting as part-time district nurses, were kept busy. Exact figures of the work done are lacking.

It can, however, be stated that three quarters of the children born in Municipal areas receive expert attention.

The Government Women's and Children's Out-door dispensary at Kandang Kerbau in Singapore under the charge of Mrs. C. H. DUKE, assisted by another lady medical officer, and a lady assistant surgeon, treated—

Year	*New Patients*	*Repetitions*	*Total*
1924 ...	... 7,572	16,543	24,904
1925 ...	... 9,701	17,203	26,904
1926 ...	... 12,767	19,480	32,247

Seven thousand one hundred and twenty-six of the new cases in 1925, were children.

The newly appointed Lady Medical Officer in Penang treated 2,011 women and children who made 5,173 attendances at her dispensary.

The appointment of three Government Health Sisters for work in the rural areas of Singapore, Penang and Malacca, has been sanctioned. They will arrive early in 1927.

GOVERNMENT MATERNITY HOSPITALS.

The numbers of women admitted to the three Government Maternity Hospitals in the Colony were—

	Admitted	*Delivered*	*Gynæcological Operations*
Maternity Hospital, Sepoy Lines Singapore	813	727	47
Free Maternity Hospital, Kandang Kerbau, Singapore ...	870	753	29
King Edward VII Maternity Hospital, Penang	872	714	70

Wards specially for children were maintained in Singapore at the General Hospital (36 beds) and at Kandang Kerbau (12 beds).

Children's Wards	*Admitted*	*Discharged*	*Died*
General Hospital, Singapore ...	344	249	78
Kandang Kerbau Hospital, Singapore	243	188	56

Hospitals for women and children with Maternity Wards were also maintained by the Medical Mission under the Bishop of Singapore in Singapore and Malacca.

There is also a Chinese hospital with a Maternity Ward maintained by the Cantonese Community in Singapore.

VI.—HOSPITALS, DISPENSARIES AND VENEREAL CLINICS

1. Total in-patients treated and mortality in all Hospitals of the Colony for past six years:—

YEAR	NUMBER TREATED			NUMBER OF DEATHS			PERCENTAGE OF DEATHS		Percentage of deaths on total
	1st and 2nd class wards	3rd class wards	Total	European	Asiatics	Total	European	Asiatics	
1921 ...	2,184	41,309	43,493	74	4,311	4,385	3·39	10·44	10·09
1922 ...	2,517	39,682	42,199	105	4,031	4,136	4·17	10·16	9·80
1923 ...	2,858	38,835	41,693	92	3,835	3,927	3·22	9·87	9·42
1924 ...	2,802	39,084	41,886	124	3,909	4,033	4·43	10·00	9·62
	Number treated 1st and 2nd class wards	Number of deaths 1st and 2nd class wards	Number treated 3rd class wards	Number of deaths 3rd class wards	Total 1st, 2nd and 3rd class wards		Percentage of deaths 1st and 2nd class wards	Percentage of deaths 3rd class wards	Percentage of deaths on total treated
					Cases	*Deaths*			
1925 ...	3,965	198	50,371	4,074	54,336	4,272	4·94	8·80	7·80
1926 ...	7,614	387	60,400	5,346	68,014	5,733	5·09	8·85	8·42

The total number of in-patients treated and the total deaths in the Hospitals of the Colony for some of the more important diseases are shown in the subjoined table with the corresponding figures for the preceding four years.

—	1922		1923		1924		1925		1926	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Malarial Fevers ...	6,989	394	5,297	376	5,135	312	7,042	429	14,293	984
Dysenteries ...	1,497	605	1,566	454	1,387	373	1,295	366	1,987	575*a*
Diarrhœa and Enteritis ...	390	9	485	22	544	41	696	67	928	89
Beri-Beri ...	1,175	168	962	28	838	136	995	150	1,228	221
Pulmonary Tuberculosis ...	1,552	722	1,714	789	1,778	849	1,966	819	1,964	853
Enteric Fever ...	116	45	92	39	93	37	159	78	258	85
Ulcers ...	3,552	9	2,577	2	2,618	10	3,357	2	4,795	4
Venereal Diseases ...	4,421	140	4,194	56	4,362	145	4,721	109	5,371	115
Ankylostomiasis ...	2,155	163	2,508	124	1,887	120	4,499	123	4,322	174

(*a*)—Dysentery Amœbic ... ... 949 cases — 258 deaths
,, Bacillary ... ... 792 ,, — 273 ,,
,, Unclassified ... ... 246 ,, — 44 ,,

3. The following terminal causes of death were noted in 840 fatal malarial cases:—

			Singapore.		
	Penang	*Malacca*	*Tan Tock Seng's Hospital*	*General Hospital*	*Total*
Coma ...	80	133	117	19	349
Cardiac Failure ..	85	37	112	60	194
Hyper-Pyrexia ...	49	4	39	—	92
Pneumonia ...	49	—	6	7	62
Cachexia ...	—	39	48	11	58
Liver Failure ...	3	1	29	2	35
Enteritis ...	6	7	9	9	31
Ankylostomiasis ...	—	—	—	9	9
Nephritis ...	3	—	4	—	7
Ruptured Spleen (Spontaneous) ...	—	—	3	—	3

4. The approximate daily cost of diets per head in the Colonial Hospitals, was:—

		$	c.
First Class ...	Full Diet	2	46
,, ...	Half ,, ...	2	33
Second Class ...	Full Diet	2	14
	Half ,, ...	2	33
Third Class (Chinese)	Full Diet		27½
	Half ,, ...		73½
	Milk ,, ...		65
,, (Tamils) ...	Full Diet		27½
	Half ,, ...		73½
,, (Sikhs) ...	Milk Diet		61
	Full ,, ...		52½
	Milk ,, ...		97½
,, (Bengali) ...	Full Diet		44
	Milk ,, ...		97½

OUT-DOOR DISPENSARIES

Year	*Total Patients*	*Total Attendances*
1926	159,903	312,090
1925	154,420	273,841
1924	96,284	167,934
1923	74,343	139,656
1922	58,005	99,488

The number of out-patients for Yaws was 8,358 as against 15,133 in the previous year: the disease is steadily decreasing owing to widespread and effective treatment of the sufferers. The attendances at the Women's and Children's Dispensary, Kandang Kerbau, Singapore, were 32,247 compared with 26,904 in 1925.

The number of cases treated by the travelling motor dispensary in Province Wellesley, was 19,471 as against 8,639, and by the travelling motor dispensary in Malacca, 8,369 as against 9,417 patients in 1925.

BUILDINGS

A description of the new General Hospital and new College of Medicine, Singapore, is given in the first part of this report.

The spacious new female leper camp at Trafalgar in Singapore was completed and occupied in September. It is adjacent to the new Mental Diseases Hospital, the construction of which was begun early in the year, and is progressing normally.

The new Venereal Diseases Clinic at Bencoolen Street, Singapore, was completed and occupied in December.

A new District Hospital of 126 beds was completed and opened at Jasin in Malacca to replace the old hospital, which was in a ruinous state.

The new hospital contains a maternity ward and headquarters for district health work.

In Penang additions were made to the accommodation at the male leper settlement in Pulau Jerejak.

The construction of a reservoir, to serve an area on which separate huts for lepers in good physical condition, are to be built, is nearly complete.

A maternity ward was built at each of the three small district hospitals in Province Wellesley.

VII.—PRISONS AND ASYLUM

A.—PRISONS

(a) *Singapore Prison*

1. The health of the prisoners was satisfactory and the sanitary condition of the Prison was good.

2. The water carriage system of sewage disposal has worked satisfactorily during the year.

3. *Admissions to the Prison Hospital.*—There were one thousand one hundred and twenty-one admissions including fifteen Europeans and five Eurasians. This with fourteen who remained from last year, gives a total treated of one thousand one hundred and thirty-five. The average daily sick was 29.03 as against 33.02 in the previous year.

4. The principal diseases treated were:—

(*a*) Dysentery Amœbic ...	19
(*b*) Dysentery Bacillary ...	16
(*c*) Dysentery unclassified	4
(*d*) Influenza	10
(*e*) Malaria	30
(*f*) Venereal Disease ...	75
(*g*) Fever not specified ...	110
(*h*) Heart Disease ...	22
(*i*) Bronchitis	47
(j) Broncho-Pneumonia ...	2
(*k*) Pulmonary Tuberculosis ...	20
(*l*) Dyspepsia	52
(*m*) Enteritis	3
(*n*) Diarrhœa ...	129
(*o*) Intestinal Colic ...	97
(*p*) Abscess	40
(*q*) Parasite Disease ...	56
(*r*) Injuries	60

5. *Deaths.*—There were 25 deaths in the Prison Hospital giving a death-rate of 21 per thousand. Of the deaths three occurred within 48 hours of admission, excluding these the death-rate was 19·4 per thousand.

6. Causes of Deaths were:—

(*a*) Dysentery Amœbic ...	7
(*b*) Dysentery Bacillary ...	3
(*c*) Malaria S. T. ...	3
(*d*) Lobar Pneumonia ...	1
(*e*) Cerebral Hæmorrhage	2
(*f*) Valvular Disease Heart	1
(*g*) Broncho-Pneumonia ...	2
(*h*) Pulmonary Tuberculosis	5
(*i*) Enteritis	1

The grades of those who died were 16 Long Sentence Prisoners, 2 Short Sentence Prisoners and Revenue Grade Prisoners and 1 Vagrant.

7. Fifteen cases were transferred to the General Hospital for major operations. Of these three died.

8. Forty-nine vagrants with serious complaints were transferred to Tan Tock Seng's Hospital, Singapore, for treatment.

9. Three prisoners, one criminal, one banishee, and one vagrant were transferred to the Leper Asylum.

10. Thirty prisoners, 15 criminals, 4 vagrants, and 11 from Civil Prison were transferred to the Lunatic Asylum, Singapore.

11. One death occurred in the association ward in the Civil Prison; the cause of death was rupture of an aortic aneurysm.

12. *Suicides*—Nil.

13. *Executions*—There were 10.—Eight Chinese, 1 Tamil and 1 Kling Islam.

14. *Corporal Punishment.*—There were 68 cases which were distributed as follows:—

(*a*) Cat-of-nine Tails ... 33 (*b*) Rattan 35

15. The figures of the different classes of prisoners are shown from the following tables.

	Criminals	*Civil*	*Vagrants*
(*a*) Total Population in Prison ...	2,647	3,755	249
(*b*) Average daily number in Prison	840	137·56	35
(*c*) Total treated in Prison Hospital	1,023	51	61
(*d*) Percentage of (*c*) to (*a*) ...	38·64	1·35	24·49
(*e*) Total deaths in Hospital ...	24	—	1

16. One thousand and nine blood examination for wassermann reaction were taken during the middle part of the year. Of these 999 results were received from the Professor of Bacteriology, of which total 292 showed positive results, a percentage of 29·23. Seven hundred and seven showed negative results.

17. *Staff.*—Dr. J. C. Carson took over duties of Medical Officer on 12th March, 1926. Assistant Medical Officer G. B. Leicester took over charge from Deputy Medical Officer F. W. Clarke on 2nd June, 1926.

(*b*) PENANG PRISON

1. The sanitary condition of the Prison and the health of the prisoners were satisfactory throughout the year.

2.—(*a*) There were 19 cases remaining in Hospital at the beginning of the year, and 188 cases were admitted during the year—making a total of 207 cases treated in all, as compared with 252 cases in 1925.

(*b*) The average daily number of sick for the year was 8·82 as compared with 18·12 for the previous year.

The principal diseases treated among the in-patients were:—

(*a*) Malarial Fever ...	13	(*f*) Diseases of Respiratory system ...	11
(*b*) Venereal disease ...	17	(*g*) Injuries	8
(*c*) Tuberculosis ...	3	(*h*) Ankylostomiasis ...	19
(*d*) Bowel disorders ...	24		
(*e*) Abscess and Boils ...	12		

(*d*) There were only two deaths during the year, with a death-rate of 9·6 per thousand as compared with three deaths and a death-rate of 19 per thousand in the previous year.

The causes of deaths were:—

(*a*) Valvular disease of the heart	1
(*b*) Pulmonary tuberculosis	1

(*e*) Sixty-three vagrants were admitted to the hospital during the year—both the deaths mentioned above occurred amongst the vagrants.

(*f*) Of the total number of Prisoners and Vagrants admitted to Prison during the year, 634 were criminals and 156 vagrants. (total 790).

(*g*) Eight hundred and seventy-seven cases were treated as out-patients during the year as compared with 2,015 in the previous year. The average daily attendance was 23.

The principal diseases treated among out-patients were:—

Bowel disorders ...	65	Diseases of respiratory system ...	69
Skin diseases	267	Venereal diseases ...	57
Opium habit	95	Eye affections	12
Fevers	48		

(*h*) There were 4 judicial hangings during the year.

(*i*) Six hundred seventy-six specimens of stools were examined during the year for ova, intestinal parasites, etc., etc.

203 were found to contain ova ankylostoma
61 ,, ,, ,, ,, ,, ascaris lumbricoides
46 ,, ,, ,, ,, ,, anky and ascaris
66 ,, ,, ,, ,, ,, trichcephalus dispar
23 ,, ,, ,, ,, ,, anky and t. dispar
8 ,, ,, ,, ,, ,, ascaris and t. dispar
8 ,, ,, ,, ,, ,, anky, ascaris and t. dispar

(*j*) Six hundred sixty-two specimens of blood were taken for the wassermann test; 261 gave a positive result.

(*c*) MALACCA PRISON

The general health of the prisoners and the sanitary condition in the prison were satisfactory.

The daily average number of inmates was as follows:—

Prisoners	38·54
Remands	3·29
Vagrants	3·61

There were 44 admissions to the Prison Hospital with 1 death.

The daily average number of sick was 12.

There were 2 executions (1 Chinese and 1 Malay).

B.—SINGAPORE LUNATIC ASYLUM

1. There remained on 31st December, 1925, five hundred and forty-four males and one hundred and seventeen females.

Two hundred and ninety males and eighty-two females were admitted during 1926.

The total treated was one thousand and thirty-three persons.

2. Of the admissions twenty-one males and eight females had previously been under treatment in this asylum.

3. Of the total treated one hundred and two males and nineteen females were discharged as recovered; twenty-eight males and twenty-two females as improved; eight males and four females as not improved. One male was discharged as not insane on admission, one male was transferred to Tanjong Rambutan, and one male to the Leper Asylum. Ten males absconded. Ninety-five males and nineteen females died. Patients discharged as not improved were handed over to the care of friends.

4. There remained on the 31st December, 1926, five hundred and eighty-eight males and one hundred and thirty-five females.

5. The average daily numbers were five hundred and seventy males and one hundred and twenty-three females.

6. The maximum and minimum daily numbers were respectively—seven hundred and thirty-five and six hundred and forty-six.

7. The nationalities of the admissions were:—

	Males	*Females*
British	6	—
Other Europeans	—	1
Eurasians	1	3
Chinese	184	63
Tamils	51	6
Malays and Allied Races	33	6
Others	15	3
	290	82

8. The physical condition of those admitted was:—

	Males	*Females*
Good	127	33
Fair	85	38
Impaired	6	8
Greatly impaired	16	3
	290	82

9. Seventeen patients died within one month of admission.

10. With regard to the causation of insanity the data obtainable are inadequate but alcohol, syphilis, and "fever" were amongst the principal causes elicited. A history of insane heredity was seldom obtained, though no doubt present in many cases, but thirty-nine of those admitted were believed to have had previous attacks of insanity.

Four patients attributed their mental disorder to voluntary abstention from opium.

11. The recovery rate for the year was 32·52 per cent.

12. *Criminal population*:—There remained on 31st December, 1925:—

(*a*) Criminal Lunatics ...	Males 17	Females 2
(*b*) Lunatic Criminals ...	,, 34	,, 6

CRIMINAL LUNATICS

During 1926:—

	Males	*Females*
(*a*) Number admitted	13	1
(*b*) Number who recovered and were returned to the Civil Prison ...	2	—
(*c*) Number who died	2	1

LUNATIC CRIMINALS

(*a*) Number admitted	26	—
(*b*) Number whose sentence expired ...	3	1
(*c*) Number who recovered	5	—
(*d*) Number who absconded	6	—
(*e*) Number who died	5	1
There remained on 31st December, 1926—		
(*a*) Criminal Lunatics	26	2
(*b*) Lunatic Criminals	41	4

13. *Mortality.*—The death-rate based on the average daily number resident was 16·45 per cent. The chief causes of death were in order of frequency dysentery, pulmonary tuberculosis, and general paralysis of the insane. These three diseases accounted for just under two-thirds of the total number of deaths.

14. *Industries.*—Nine thousand nine hundred and eighty-four yards of cotton cloth were woven by the male patients for use in the asylum.

15. *Revenue.*—Ten thousand seven hundred and seventy-seven dollars and twenty cents.

16. The garden furnished 29,794 lbs. of vegetables, 100 lbs. of sugar cane, 60 bunches of bananas and a few soursops.

17. The number of insane persons belonging to the Straits Settlements who are under care and control shows a steady increase in recent years, but there is some encouragement in the fact that there were less admissions into the asylum during 1926 than in the previous year, although the population of the Straits Settlements is estimated to increase considerably each year.

18. Dr. CARSON was in-charge of the asylum until 10th April, 1926, on which date I resumed duty, having returned from leave.

E. R. STONE,
Medical Superintendent,
Lunatic Asylum,
Singapore.

31st January, 1927.

VIII. METEOROLOGICAL

Since 1869 the Medical Department has kept records of the rainfall, temperature, humidity and barometer.

The mean temperature for the year was above the normal: it was 79·9° F. in Singapore, 82·2° F. for Penang, 81·9° F. for Frovince Wellesley and 83° F. for Malacca.

The year was an exceptionally trying one due to deficient rainfall, and to an unusual spell of drought in the first six months.

The driest month in Singapore was May 65 millemetres, and the wettest December 316 millemetres of rain.

The total rainfall for the year in Singapore was only 2,172 millemetres against 2,959 millemetres in 1925.

The driest month in Penang was February when only 11 millemetres of rain fell. The wettest month was in December, 634 millemetres of rain. The total rainfall for the year in Penang was 2,967 millemetres against 3,738 millemetres in 1925.

The driest month in Malacca was in February, 60 millemetres of rain. The wettest month was in December, 321 millemetres. The Malacca rainfall totalled 2,409 millemetres against 2,726 millemetres in 1925.

Remarks on the effects of the deficient and unevenly distributed rainfall on the mortality will be found in Part II of this report—Public Health.

An effort to bring the meteorological conditions to the notice of the inhabitants was continued by furnishing the most important data to the Singapore European papers daily. It is gratifying to note that the reports are displayed in a suitable part of the paper, where they can catch the eye without difficulty.

A further effort has been made to inform the public of the weekly condition of the various hill stations, in the neighbourhood. The returns from Garoet in Java, and Brastagi in Sumatra, are a weekly mean of returns taken during several years' past, since it is impossible to obtain a weekly telegram without payment. The returns from Penang Hill, Taiping Hill and Fraser's Hill are telegraphed to the department each week.

Meteorological returns for the year will be found in Table *IV* and also two graphs supplied by Dr. GILBERT BROOKE showing the wettest and driest months since 1869, and the annual rainfall in inches and millemetres since 1862.

IX.—SCIENTIFIC

The following reports are attached as appendices:—

A. Report on Leper Asylum, Singapore.
B. Report on Treatment of Leprosy in Pulau Jerejak Leper Settlement.
C. Report on the Pathological Branch, Straits Settlements.
D. Report on the Government Analysts' Branch, Straits Settlements.
E. First Annual Report of the Straits Settlements Rural Sanitation Campaign.
F. Report on Tan Tock Seng's Hospital, Singapore.
G. Report on Treatment of Scabies by the Danish Method.
H. Report on the treatment of Opium Habit.
I. Report on Women's and Children's Dispensary, Kandang Kerbau.
J. Report of the Radiologist, Singapore.
K. Reports on Schools.
L. Report on Social Hygiene.
M. Scientific Report by the Professor of Bacteriology.
N. Scientific Report by the Professor of Biology.

A. L. HOOPS,
Principal Civil Medical Officer,
Straits Settlements.

APPENDIX "A"

Leper Asylums

I.—LEPER ASYLUM, SINGAPORE

Report by Dr. E. D. Lindow, m.r.c.s., l.r.c.p.

1. Male Leper Camp at McNair Road—

Remained on 31st December, 1925	36
Admitted during 1926	81
Discharged during 1926	7
Died during 1926	10
Absconded during 1926	11
Transferred to Pulau Jerejak	51
Discharged to China (not cured)	1
Remaining on 31st December, 1926	37

Immediate causes of death—

Sapræmia from septic ulcerations	4
Septicæmia from advanced leprosy	1
Chronic amœbic dysentery	2
Beri-Beri	1
Lobar Pneumonia	1
Subtertian Malaria	1

2. Female Leper Camp at Kandang Kerbau, transferred to Trafalgar on 3rd September, 1926.—

Remained 31st December, 1925	41
Admitted during 1926	14
Discharged in 1926	—
Died in 1926	4
Transferred in 1926	—
Remaining on 31st December, 1926	51

Immediate causes of death—

Septicæmia from advanced leprosy	2
Chronic parenchymatous nephritis	1
Chronic amœbic dysentery	1

3. Return of injections administered—

	Males.	*Females.*
Ol Hydnocarpus Wightiana with ½ per cent Iodine	2,396	2,794
E. C. C. O.	—	69
N. A. B.	248	166
Sulpharsenol	—	64
Sodium Morrhuate	306	—
Sodium Soyate	156	—
Sodium Morrhuate and Soyate	172	—

Results of Treatment—

	Males.	*Females.*
Cured	7	—
Definite Improvement	4	7
Slight improvement	9	17
Stationary	15	22
Retrogressing	8	5

4. Treatment—

The health of the Male Leper Camp continues satisfactory, and the patients seem satisfied with their surroundings, but even the locally born patients are beginning to realize that their chance of cure is enhanced in the more spacious Settlement at Pulau Jerejak.

Band instruments were provided for the patients while football, badminton and ping-pong were introduced; as a result the health of the patients both physically and mentally has been improved.

The Female Camp was transferred from Kandang Kerbau to the more spacious and well ventilated camp at Trafalgar, 7½ mile stone on the Yeo Chu Kang Road on 3rd September. The camp is well laid out, situated on a elevated site and has caused great contentment among the patients.

The building consists of an administration block, and three large wards each having attached two single-room wards and two store rooms. The whole camp is capable of taking 75 patients with comfort, while more land is available for further building extension, if required. Modern sanitation has been installed with adequate bathing facilities, and the sanitary condition is very satisfactory.

There is ample ground for cultivation, the soil being very fertile, and patients are encouraged to, and do, avail themselves of the opportunity of supplementing their rations. The general health of the patients has improved markedly since their change of environment.

The methods of treatment were as follows.—

(*a*) *Intercurrent Disease*.—Such conditions as dysentery, beri-beri and ankylostomiasis were given treatment before actually commencing anti-leprotic methods.

As experienced the previous year, the treatment of syphilis by arsenical preparations proved very disappointing. After several courses of anti-syphilitic treatment, only one patient in six recorded any change in the wassermann reaction.

Consequent upon the fact that patients are very prone to reactions after this treatment and the leprous lesions showed no signs of improvement, it was decided to abandon anti-syphilitic treatment.

(*b*) The main drug used in treatment was oil of Hydnocarpus Wightiana with ½ per cent iodine, injected bi-weekly into the loose subcutaneous tissues. The commencing dose is 2 *cc.* and increasing by 0·5 *cc.* at each subsequent injection until a maximum dose of 5 *cc.* is reached. The area injected is gently massaged to distribute the oil evenly, thus increasing its rate of absorption. The drug is generally well tolerated and reactions are both rare and mild in character.

(*c*) In May, alternative treatment of a few selected cases was adopted—the drugs utilized being the sodium salts of cod liver oil and soya bean. A 3 per cent solution of both drugs with the addition of ½ per cent carbolic acid, was introduced subcutaneously with the following results:—

Sodium Morrhuate	10 cases.
Lesions disappeared	—
Much improved	1
Improving	2
Not improved	7
Sodium Soyate	8 cases.
Lesions disappeared	—
Much improved	—
Improving	2
Not improving	6
Sodium Morrhuate and Soyate	6 cases.
Lesions disappeared	—
Much improved	—
Improving	1
Not improved	5

Assistant Surgeon TAN ENG HAN was in charge of both camps.

APPENDIX "B"

TREATMENT OF LEPROSY AT PULAU JEREJAK

BY DR. A. M. WHEATLEY, *Deputy Medical Officer, Leper Settlement.*

Six hundred and eighty-one cases were under special treatment for Leprosy during the year 1926. Out of this number, 490 were of the advanced type.

The lowering of the death-rate from 30·68 in 1921 to 13·76 in 1926 shows how beneficial special treatment is to all cases.

Before commencing any special treatment, as the majority of cases are debilitated on admission, it is the practise here to try and improve the general health.

Intercurrent diseases as malaria, hook-worm, syphilis, are treated, and with cleanliness, tonics, and good dieting, most cases show a rapid improvement in their general condition.

Special Treatment.—Hydnocarpus Wightiana Oil obtained fresh from Ernakulum, Southern India, has been the main drug used for injection purposes. Once a week, to a pound of the oil, 4 per cent cresote is added, and this is sterilized in a water bath.

The commencing dose, varies with the case. Cases with diffuse skin lesions are given a small commencing dose; the average dose has been 2 *cc.* gradually increased according to individual toleration. The maximum dose has been 8 *cc.* The oil is injected into the loose subcutaneous tissues on the outer and posterior surfaces of the limbs. There is some pain on injection but it soon passes. Gentle massage of the injected areas helps to distribute the oil evenly. On non-injection days the oil without cresote is taken internally twice daily by those who can tolerate it, commencing with 10 mins. and increasing gradually as long as there is no nausea.

The maximum dose by mouth has been 30 mins. twice daily.

Others take powdered Hydnocarpus Wightiana kernels plain or mixed with hemp seed, one part to three parts of Hydnocarpus Wightiana kernels, known as TAI FONG CHEE. The usual dose of this has been 20 grains twice daily.

Sodium Morrhuate with Sodium Soyate 3 per cent with ½ per cent Carbolic Acid

This is given intravenously once weekly, commencing with 1 *cc.* and increasing by 1 *cc.*, the increase in dosage varying with the reaction.

The maximum dose was 5 *cc.* On non-injection days the oil or powdered Hydnocarpus Wightiana kernels has been given as described before.

To advanced cases, TAI FONG CHEE, consisting of Hydnocarpus Wightiana kernels, 3 parts with Indian hemp seed 1 part has been given orally in a dosage varying from 10 to 30 grains daily, without injections.

Daily baths with rubbing of the whole body with Hydnocarpus oil, helps to clean skin lesions.

Counter irritation by painting the lesions with Acid Trichloracetic 1-3 for nodules and thickened ears, and 1-5 for face and skin lesions is a useful adjunct. The right amount of painting is indicated by slight whitening of the skin.

Exercise is encouraged by cutting of fire-wood, carpentry, blacksmith's work, vegetable planting, grass cutting and walking.

Surgical treatment is beneficial and very necessary.

The following is the list of the operations:—

Choparts, amputation of the foot	1
Modified Symes	1
Removal of necrosed bone	80
Amputation fingers	60
Amputation toes	42
Excision nodules	38
Scraping ulcers	176

For foul ulcers I have found the following useful as a dressing:—

Icthyol	3 iii
Cresote	m xx
Glycerine	1 ounce.

The ulcers clean up very rapidly.

For neuritic pains injection of Soda Salicylas grs: x to 3 *cc.* of normal Saline injected intramuscularly gives remarkable relief.

For leprotic fever subcutaneous injections of adrenalin hydrochloride min. 2 with 20 mins. normal saline is useful.

THE FOLLOWING FIGURES SHOW THE RESULT OF SPECIAL TREATMENT

1. Hydnocarpus Wightiana Oil with 4 per cent Cresote.

Number of cases treated	316
Lesions disappeared	16
Definitely improved	105
Improved	162
Not improved	33

2. Sodium Morrhuate with Sodium Soyate 3 per cent with ½ per cent Carbolic Acid.

Number of cases treated	20
Lesions disappeared	1
Definitely improved	1
Improved	7
Not improved	11

3. Tai Fong Chee.

Number of cases treated	345
Lesions disappeared	—
Improved	229
Not improved	116

The following are illustrative cases, apparently cured. 1926.

1. Tong Ah Chuah.—Teochew.

Admitted on 6th July, 1924.

Duration of leprosy $1\frac{1}{2}$ years.

Condition on admission.—Large leprous masses on forehead extending on to nose, and right eye, ears thickened. Scattered nodules on face. Smears positive.

Treatment.—

1924—3 per cent sodium morrhuate intravenously—36 injections.

1925—Camphorated Hydnocarpus Wightiana Oil subcutaneously—48 injections.

1926—Hydnocarpus Wightiana Oil with Cresote subcutaneously—15 injections.

He was discharged on 23rd April, 1926, free from all signs of leprosy, and bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

2. Tong Tuck.—Cantonese.

Admitted 7th April, 1923. Age 23 years.

Duration of disease, 2 years.

Condition on admission.—Thickened leprous patches on face, ears thickened. Smears positive for Lepra bacilli.

Treatment given.—

1923—5 per cent Thymol et Moogrol intramuscularly—19 injections.

1924—E. C. C. O. (Muir's). Intramuscularly—43 injections.

1925—Hydnocarpus Wightiana Oil Camphorated intramuscularly—40 injections.

1926—Hydnocarpus Wightiana Oil with 4% Cresote 39 injections.

1926—Hydnocarpus Wightiana Oil with 4 per cent Cresote—36 injections.

Condition on 31st December, 1926.

Free from all leprous lesions. Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

3. **Ramalingham.**—Tamil—24 years of age.

Duration of disease 2 years and 3 months.

Admitted on 12th November, 1923.

Condition on admission.—A very sickly looking subject. Leprous patches on forehead, both ears thickened. Ulna nerves thickened and enlarged. Anæsthesia of fingers. Smears positive.

Treatment.—

1923—5 per cent Thymol with Moogrol intramuscularly—11 injections.

1924—5 per cent Thymol with Moogrol intramuscularly—26 injections.
5 per cent Thymol with Antileprol intramuscularly—16 injections.
5 per cent Thymol with Moogrol intramuscularly—20 injections.

1925—Camphorated Hydnocarpus Wightiana Oil intramuscularly—65 injections.

1926—Hydnocarpus Wightiana Oil with 4 per cent Cresote intramuscularly—32 injections.

Condition on 31st December, 1926.

Free from all leprous lesions.

Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

4. F. **Bell.**—Eurasian—13 years of age.

Admitted on 6th August, 1923.

Duration of disease 1 year.

Condition on admission.—Leprous patches on ears with thickening. Patches on chest, back, and thighs. Roseolar patch on face said to be a birth mark.

Treatment.—

1923—3 per cent sodium Hydnocarpate et Soyate, intravenously—22 injections.
3 per cent Sodium Morrhuate intravenously—16 injections.
E. C. C. O. (Muir's) intramuscularly—14 injections.
5 per cent Thymol et Moogrol intramuscularly—16 injections.

1924—3 per cent Sodium Morrhuate intravenously—22 injections.
3 per cent Sodium Soyate intravenously—26 injections.

1925—Camphorated Hydnocarpus Wightiana Oil subcutaneously—49 injections.

1926—Hydnocarpus Wightiana Oil with 4 per cent Cresote subcutaneously—30 injections.

Condition on 31st December, 1926.

Free from all leprous lesions.

Ears Normal. Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

5. NG AH SENG *alias* SEE SIT.—Cantonese. Age 36 years.

Duration of disease 3 years.

Admitted 30th March, 1924.

Condition on admission.—Both ears thickened and ulcerated skin of forehead thickened. Raised leprous patches on cheeks. Large leprous patches on abdominal wall. Smears positive.

Treatment.—

1924—Bismuth Tartrate intramuscularly—4 injections.
5 per cent Thymol et Moogrol intramuscularly—59 injections.

1925—3 per cent Sodium Morrhuate intravenously—86 injections.

1926—3 per cent Sodium Morrhuate et Soyate intravenously—48 injections.

Condition on 31st December, 1926.

Free from all leprous lesions.

Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

6. Marthasamy.—Tamil. Age 25 years.

Duration of disease 1½ years.

Date of admission 25th September, 1925.

Condition on admission.—Both ears thickened, leprous patches on nose and left cheek. Smear positive.

Treatment.—

1925—Camphorated Hydnocarpus Wightiana Oil subcutaneously—12 injections.

1926—Hydnocarpus Wightiana Oil with 4 per cent Cresote—subcutaneously—39 injections.

Condition on 31st December, 1926.

Free from all signs of leprosy.

Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

7. Hoh Tuck.—50 years of age.

Duration of disease 1 year.

Date of admission 22nd April, 1925.

Condition on admission.—Ears, lobes thickened. Leprous patches on body. Ulcers legs. Very debilitated.

Treatment.—

1925—Camphorated Hydnocarpus Wightiana Oil subcutaneously—26 injections.

1926—Hydnocarpus Wightiana Oil with 4 per cent Cresote—subcutaneously—30 injections.

Condition on 31st December, 1926.

Free from all signs of leprosy.

Bacteriologically negative.

PHOTOGRAPH NOT REPRODUCED

The following are some cases showing definite improvement to an apparent cure :—

1926

LEPER SETTLEMENT, PULAU JEREJAK

PHOTOGRAPH NOT REPRODUCED

ADDITIONAL PHOTOGRAPHS

PHOTOGRAPH NOT REPRODUCED

FEMALE LEPER WARDS, JELUTONG

1. Forty-three inmates remained in occupation of the female leper wards at the beginning of the year—10 Perak lepers and 33 Colonial lepers.

2. There were 4 admissions during the year—1 Perak and 3 Colonial.

3. Nine deaths occurred during the year—3 Perak and 6 Colonial—giving a death-rate of 5·2 as compared with 3·32 of the previous year.

4. The average daily number of inmates for the year was 40·27.

5. Up to the Principal Civil Medical Officer's visit in September, 32 female lepers were receiving regularly twice weekly injections of Sodium Morrhuate, in addition to oral administration of Chaulmoogra Oil in Capsules and inunction of the oil. This treatment was discontinued after September, the lepers being put on the same lines of treatment as is being carried out at the Leper Asylum at Pulau Jerejak.

Fifteen cases have been selected, whose lesions appear to be of the more recent type. Injections of Hydnocarpus Wightiana Oil with 4 per cent Cresote are given them subcutaneously regularly once weekly; in addition oral administration of Hydnocarpus Wightiana Oil in capsules minims 5 commencing dose increasing up to toleration is being administered on the days they are not injected.

Trichloracetic acid (T. A. C.) is being painted on the skin lesions which are not in the advanced stage. The Tai Foong Chee treatment is still being continued, the lepers not put on the above treatment, receiving it.

6. Necessary minor repairs, whitewashing and painting to the buildings were carried out during the year.

APPENDIX "C"

Pathological Branch

I. SINGAPORE

Report by J. C. Tull, m.d., m.r.c.p. (London), *Government Pathologist*

Laboratory, Sepoy Lines

Total number of specimens examined		... 4,344
Blood films—		
Malaria parasite present	4	 88
,, ,, absent	51	
Differential count	1	
Leishman—Denovan bodies, absent	1	
Trypanosomes, absent	1	
Blood count: leucocytes and red cells	1	
Blood Cultures	...	 8
Blood sugar estimations	...	 3

Cerebro-spinal fluid—		
Meningococcus present	2	
,, absent	3	
Pneumococcus present	1	
Tubercle bacillus present	1	29
,, ,, absent	11	
Cell count, and reaction for globulin and albumin ...	11	
Diphtheria—Cultures from throat and nasal swab—		
K. L. Bacillus present	3	33
,, ,, absent	30	
Examination of pus ,etc.		24
Faeces—		
E. Histolytica—active—present	8	
,, cysts ,,	3	
Bacillary dysentery ,,	1	
Ova ,,	26	
Ova absent	99	143
Lamblia present	1	
Tricomonas intestinalis ,,	3	
Occult blood absent	2	
Histological Sections		148
Examination of blood stains for presence of blood—		
Present	2	3
Absent	1	
Films for Gonococcus—Present	36	94
Absent	58	
Films for B. Leprae—Present	6	10
Absent	4	
Films for Treponema pallidum—Absent		4
,, ,, Absent	16	
Sputum—Tubercle bacillus—Present	6	23
Pneumococcus Present	1	
Stomach contents—Bile present, blood absent		1
Tricomonas vaginalis in urine ...		1
Urine, Albumin, casts, organisms, etc. ...		199
Autogenous vaccines prepared ...		9
Widal Reactions—		
1. B. Dysenteries—B. Flexner—positive	1	
,, negative	2	
B. Shiga —positive	2	
negative	2	
2. Food poisoning —negative	1	
3. B. Typhosus —positive	69	355
Partially ,,	47	
Negative	219	
4. B. Paratyphosus *A*. Negative	6	
5. B. ,, *B*. Negative	6	
Wassermann reaction (Blood and cerebro-spinal fluid)—		
Positive + +	1,194	
Positive +	264	
Positive	138	3,177
Negative	1,581	
Bacteriological examination of water ...		13

In June, 1926, the work was re-distributed between the Government Pathologist and Professor of Bacteriology, King Edward VII College of Medicine. Since this time the bacteriology, and wassermann reactions from the venereal diseases clinic have been done by the latter. In spite of this division, the total number of specimens examined in this laboratory has increased considerably.

CENTRAL MORTUARY, SEPOY LINES

Total number of post mortem examinations	392
Number at which protocols were taken	392
Coroner's cases	221
Number dying within 24 hours of admission	101
Number dying within 48 hours of admission	20

Return showing immediate cause of death.

Accidents	119
Beri-beri	28
Bubonic plague	2
Asiatic cholera	3
Diphtheria	1
Dysentery—Amœbic	4
Bacillary	9
Mixed type	1
Enteric fever	13
Pneumonia—lobar	31
broncho	19
Malaria—Acute	33
Meningitis	9
Neoplasms	9
Poisoning	14
Senility	1
Suppurative peritonitis	11
Still born	2
Varied septic conditions	9
Tetanus	3
Tuberculosis	20
Uræmia	4

Dying of diseases referable to systems.

Diseases of the Alimentary System	13
,, ,, Circulatory System	25
,, ,, Genito Urinary System	3
,, ,, Nervous System	3
,, ,, Respiratory System	1

Return showing incidence of diseases.

Beri-beri	29
Diphtheria	1
Dysentery—Acute Amœbic	3
Chronic Amœbic	5
Acute Bacillary	11
Enteric fever	17

Malaria—Subtertian	32
Benign tertian	1
Pigment only	18
Neoplasms—Carcinoma	5
Sarcoma	3
Pseudomyxoma	1
Syphilis	33

Pneumonia—Lobar ...	35	Plague—bubonic ...	2
Broncho ...	24	Tetanus	3
Septic Broncho	1	Cholera	3
Schistosomiasis Japonicum ...	1	Uræmia	4
Meningitis	10		

Return Showing Systems Affected

A.—Nervous System

Cerebral softening ...	1	Meningitis—Pneumococcus	3
		Septic ...	1
Cerebral hæmorrhage ...	2	Tubercle bacillus	4
		Syphilitic ...	2
Gumma of brain ...	2	Calcified nodule cerebrum ...	1

B.—Circulatory System.

Acute cardiac dilatation ...	10	Pericarditis—Pneumococcus	1
Fatty degeneration of heart	2	Septic ...	1
Gumma heart wall ...	1	Hæmopericardium ...	1
Endocarditis—		Aortic Stenosis ...	2
Aortic, acute ...	1	Aortic incompetence from dilatation aortic ring ...	4
,, chronic ...	2		
Myocarditis—		Aneurysmal dilatation of aorta	4
		Aortic aneurysms—	
Chronic	1	Arch	4
Syphilitic	3	Descending thoracic	2
Cœliac axis	1		

(Six of the seven aneurysms had ruptured)

Aortitis—syphilitic	31
Arterio-sclerosis	5

C.—Respiratory System

Diphtheria, larynx etc. ...	1	Lobar pneumonia—acute ... (divided as follows).	35
Broncho pneumonia ...	24	(*a*) Bilateral	12
Septic Broncho pneumonia ...	1	(*b*) Right upper lobe ...	7
Empyema	5	(*c*) Right upper and middle lobes	2
Emphysema	2	(*d*) Right middle and lower lobes	3
Pneumothorax	1	(*c*) Right middle lobe ...	1
Pulmonary collapse ...	6	(*f*) Right lower lobe ...	10
Pleuritis—acute ...	18	(*g*) Massive of right lung ...	6
chronic ...	5	(*h*) Left upper lobe ...	4
Tuberculous ...	11	(*i*) Left lower lobe ...	11
		(*j*) Massive of left lung ...	3

Pulmonary Tuberculosis—Acute	36
Chronic	1
Quiescent	5
Oedema glottis	2

D.—Alimentary System

Glossitis—Syphilitic ...	1	Gastric ulcer—Due to corrosive ...	1
Retropharyngeal abscess ...	1	Acute ...	1
Ulceration œsophagus—Diphtheritic ...	1	Chronic ...	3

(The acute ulcer had perforated: one chronic ulcer had perforated: one chronic ulcer had caused extensive hæmorrhage)

D.—ALIMENTARY SYSTEM—*Continued*

Chronic pyloric obstruction for cancer ...	1
Acute intestinal obstruction	1
Strangulated hernia ...	1
Acute appendicitis ...	1
Typhoid ulcers intestine ...	17
(Five of these cases had perforated).	
Dysentery—Amœbic, acute	3
,, chronic	5
Bacillary, acute	11
Mixed type ...	1
Tuberculosis intestine ...	1
Schistosomiasis intestine ...	1
Perihepatitis—syphilitic ...	1
Cirrhosis liver—	
(*a*) Bacillary ...	1
(*b*) Nodular	3
(*c*) Syphilitic	3
(*d*) Due to schistosomiasis	1
Abscess liver—Amœbic ...	1
Pyæmic ...	1

Cyanotic atrophy liver ...	1
Perisplenitis—syphilitic ...	3
Tuberculosis spleen ...	2
Acute cholecystitis ...	3
Acute cholangitis ...	4
Biliary calculi	5
Peritonitis—Acute localized	1
Acute general ...	15
Chronic localized	2
Tuberculous ...	1
Subphrenic abscess ...	1
Neoplasms—	
Primary carcinoma naso pharynx	2
Primary carcinoma stomach	2
Lymphosarcoma—stomach	1
Primary carcinoma liver	2
Secondary carcinoma liver	1
,, ,, spleen	1
Hæmangioma, liver ...	1
Pseudo-myxoma of ovary with secondary growths on peritoneum	1

E.—GENITO-URINARY SYSTEM

Nephritis—Acute parenchymatous ...	4
Chronic parenchymatous ...	5
Chronic interstitial ...	9
Pyelitis	1
Pyelo-nephritis	2
Pyonephrosis	1
Pyohydronephrosis ...	1
Nephrolithiasis	2

Perinephric abscess ...	1
Cystitis—Acute	1
Rupture urethra ...	1
Chronic gonorrhœa ...	1
Septic endometritis ...	1
Pyosalpingitis	1
Hæmosalpingitis ...	1
Ovarian cyst	1
Pregnant uterus (3 months)	1
Neoplasms—Pseudomyxoma ovary ...	1

F.—EXTERNAL CAUSES

Asphysia—Drowning ...	14
Hanging ...	7
Strangulation ...	4
Suffocation ...	1
Poisoning—Opium ...	7
Chloroform ...	3
Caustic soda	1
Potassium cyanide	1
Ammonia and Tartaric acid	1
Tuba roots ...	1
Electric shock	1
Gun shot wounds—Chest ...	9
Lungs ...	7
Heart ...	1
Abdomen	4
Intestine	2
Stomach	1
Skull ...	3
Brain ...	3

Stab wounds—Chest ...	7
Heart ...	5
Lungs ...	3
Abdomen ...	7
Stomach ...	4
Liver ...	3
Spleen ...	1
Kidney ...	2
Intestine ...	2
Thigh ...	1
Neck ...	2
Throat ...	3
Aorta ...	3
Carotid arteries	1
Subclavian artery	1
Fractures—Skull ...	29
Spine ...	4
Ribs ...	12
Sternum ...	3
Humerus ...	1
Femur ...	2
Tibia and fibula	1
Pelvis ...	3

F.—External Causes—*Continued*

Ruptures—Spleen	11
Liver	6
Heart	2
Aorta	1
Lungs	2
Intestine	1
Kidney	2
Bladder	2
Urethra	1

Lacerations—Brain	17
Lung	4
Kidney	1
Spleen	1
Liver	1
Intestine	1
Hæmorrhage—Peritoneal Sac.	31
Hæmothorax	23
Hæmopericardium	1
Stomach	1
Subdural	29
Extradural	4
External	10

G.—Varied Conditions

Status lymphaticus	2	Puerperal septicæmia	2
Septicæmia	5	Psoas abscess	1
Sapræmia	1	Lympho sarcoma	2
Shock	1	Carcinoma—Secondary abdominal glands	1
Cellulitis—Axilla	2	Tuberculosis Mediastinum	1
Arm	1	Still born	2
Thigh	1	Hemiplegia	1
Neck	1		

H.—Helminthiasis

Ascaris lumbricoides	22
Ankylostomes	2
Trichyuris trichiura	6
Clonorchis sinensis	6
Schistosomum Japonicum	1

The new Central Mortuary, Sepoy Lines, has been in use since the middle of September, 1926.

TAN TOCK SENG MORTUARY

Total number of post mortem examinations	1,872
Number at which protocols were taken	1,312
Coroner's cases	201
Died within 24 hours of admission	185
Died within 48 hours of admission	71

Return showing immediate cause of death in the 1312 cases in which protocols were taken.

Accidents	95
Ankylostomiasis	1
Beri-beri	77
Dysentery—Amœbic	74
Bacillary	69
Mixed type	2
Enteric fever	17
Leprosy	1
Lobar pneumonia	153
Broncho pneumonia	36
Gangrene lung	1
Malaria, acute	239
Neoplasms	45

Varied septic conditions	56
Schistosomiasis	3
Suppurative peritonitis	39
Tuberculosis	162
Too decomposed for diagnosis	9
Uræmia	3

DYING OF DISEASES REFERABLE TO SYSTEMS

Alimentary system	46
Circulatory system	88
Genito urinary system	50
Nervous system	22
Respiratory system	19

RETURN SHOWING INCIDENCE OF DISEASES

Beri-beri	79
Dysentery—Amœbic acute	43
Amœbic chronic	54
Bacillary, acute	65
Bacillary, chronic	16
Mixed type	3
Enteric type	27
Leprosy	3
Malaria—Acute	254
Subtertian	203
Benign tertian	17
Quartan	4
Subtertian and benign tertian	27
Subtertian and quartan	3
Malarial pigment only	51
Neoplasms—Carcinoma	47
Sarcoma	2
Pneumonia—Lobar	169
Broncho	55
Septic	7

A.—NERVOUS SYSTEM

Cerebral softening ...	12
,, hæmorrhage ...	4
Cerebellar abscess ...	1
Gumma, cerebrum ...	4
,, spinal cord ...	1
,, dura mater . .	1
,, skull	1
,, scalp	1

Meningitis—pneumococcus	3
septic ...	3
syphilitic ...	5
tuberculous ...	3
Traumatic myelitis ...	2
Neoplasms—Carcinoma base skull ...	1
Sarcoma cerebrum ...	1

B.—CIRCULATORY SYSTEM

Acute cardiac dilatation ...	16
Brown atrophy heart ...	5
Endocarditis—	
Acute left ventricular wall	1
acute aortic	8
chronic aortic ...	13
acute mitral	4
Chronic mitral ...	5
Myocarditis—acute ...	3
chronic ...	13

Pericarditis—	
acute pneumococcus ...	20
acute septic	3
chronic tuberculous ...	1
chronic adhesive ...	5
Gumma heart wall ...	1
Hæmopericardium ...	1
Hydropericardium ...	8

C.—Respiratory System

Bronchitis, chronic	3
Bronchiectasis	4
Empyema	19
Empyema interlobar	1
Emphysema	3
Hæmothorax	7
Hydrothorax	16
Pneumonia—Broncho	55
Septic	7
Lobar acute	150
,, unresolved	19
,, bilateral	18
Of the lobar pneumonias there were:—	
Right upper lobe	17
Right upper and middle lobes	13
Right upper and lower lobes	5
Right middle and lower lobes	12
Right middle lobe	4
Right lower lobe	36
Massive of right lung	28
Left upper lobe	11
Left lower lobe	53
Massive of left lung	16
Pleuritis—acute	104
chronic	33
tuberculous	48
Pleurisy with effusion	13
Lung abscess	9
,, collapse	13
,, gangrene	5
,, infarct	1
Tuberculosis of lung	209
(Acute 88; chronic 8; quiescent	13)
Tuberculosis, larynx	1
Septic ulcer larynx	1
,, ,, trachea	1
Neoplasms—Carcinoma bronchus	1
Carcinoma lung secondary	8

D.—Alimentary System.

Tuberculous ulcer palate	1
Ulcer oesophagus	1
Fibrosis stomach, syphilitic	1
Gastric ulcer—acute	2
chronic	12
(The acute ulcer had caused extensive hæmorrhage: 3 of the chronic ulcers had perforated)	
Acute dilatation of stomach	1
Gastritis, acute	1
Paralytic ileus	1
Appendicitis—Acute	2
chronic	1
gangrenous	1
abscess formation	1
Rupture colon	1
Tuberculosis intestine	21
Schistosomiasis intestine	6
Typhoid ulcers intestine	27
(Nine of which had perforated)	
Dysentery—amœbic, acute	43
,, chronic	54
Bacillary acute	65
,, chronic	16
Mixed type	3
Enterocolitis	4
Perihepatitis—chronic	2
syphilitic	7
tuberculous	2
Hepatic cirrhosis—	
Nodular	23
Syphilitic	19
Biliary	5
Due to schistosomiasis	6
Liver—Gumma	4
,, Amœbic abscess	5
,, Pyæmic abscesses	3
,, Cyanotic atrophy	6
,, Fatty degeneration	12
,, Hæmangioma	1
Perisplenitis—chronic	3
syphilitic	6
Duodenal ulcer—acute	1
chronic	2
Ulcer jejunum	1
Pyloric obstruction fr. cancer	1
Intestinal obstruction—chronic	3
Stricture—large intestine	2
,, rectum	1
Intussusception	2
Strangulated herina	1
Gangrene intestine	3
Spleen—abscess	3
infarct	7
tuberculosis	2
rupture	9
Cholecystitis—acute	5
Cholangitis—acute	15
Biliary calculi	13
,, fistula	1
Pancreas—abscess	1
Peritonitis—acute, localized	5
,, general	45
chronic localised	2
,, tuberculous	4
Perityphlitis	1
Subphrenic abscess	4
Ascites	29
Ascites, bloodstained	1

Neoplasms—	
Epithelioma, soft palate	1
Carcinoma, primary oesophagus	6
Carcinoma, primary stomach	14
Carcinoma, primary transverse colon	1
Carcinoma, primary gall bladder and head of pancreas	1
Carcinoma, primary, gall-bladder	1
Carcinoma, secondary pancreas	2
Carcinoma, primary, liver	16
,, secondary liver	8
,, secondary spleen	2

E.—GENITO URINARY SYSTEM

Nephritis—acute parenchymatous	4
chronic parenchymatous	20
chronic intestinal	24
Pyelonephritis	13
Pyonephrosis	1
Tuberculosis kidney	2
Infarcts kidney	3
Waxy degeneration kidney	3
Contusion kidney	1
Undeveloped kidney	1
Congenital cystic kidneys	1
Nephrolithiasis	2
Cystitis—acute	5
chronic	2
Chronic gonorrhœa	1
Hydrocele	4
Calculus—urinary bladder	1
Stricture—urethra	1
Abscesses, testicles and scrotum	1
Hernia testis	1
Suppurative hydrocele	1
Pregnant uterus (early)	1
Neoplasms—Carcinoma kidney—primary	1
Adenoma prostate	1
Epithelioma—penis	1

F.—EXTERNAL CAUSES

Asphyxia—Drowning	10
Hanging	5
Poisoning—Quinine and dilute nitric acid	1
Burns	2
Stab wounds—Throat	1
Chest	1
Neck	3
Left carotid artery	2
Intestine	1
External iliac artery	1
Lungs	2
Heart	1
Liver	1
Fractures—Skull	32
Ribs	15
Ulna	1
Humerus	2
Femur	4
Ununited fracture femur	2
Sternum	4
Spinal column	6
Pelvis	1
Tibia	1
Gun shot wounds—Abdomen	4
Skull	1
Aorta	2
Intestine	5
Urinary bladder	1
Chest	4
Heart	1
Lungs	3
Trachea	1
Spinal cord	1
Ruptures—Left middle meningeal artery	2
Right middle meningeal artery	2
Cavernous sinus	1
Liver	8
Spleen	9
Colon	2
Kidney	2
Urethra	1
Lacerations—Cerebrum	13
Cerebellum	1
Lungs	1
Hæmorrhage—Subdural	32
Extra dural	9
Peritoneal sac.	19
Hæmothorax	8
Lungs	1
Stomach	3
Pericardium	1
External Hæmorrhage	3

G.—VARIED CONDITIONS

Pyæmia	3
Cellulitis neck	1
Otitis media, acute, right	2
Sapræmia	19
Septicæmia	14
Septic arthritis	1
Gangrene neck etc.	1
Cellulitis—Thigh	5
Arm	2
Leg	4
Pelvis	1
Tuberculosis—Glands neck	2
Mediastinum	2
Knee joint	1
Hip joint	2
Spine	1
Periostitis—Syphilitic	2
Osteomyelitis—femur	1
Hemiplegia	3
Arsenical dermatitis	1

Shock	2
Epilepsy	1
Senility	1
Leprosy	2
Neoplasms—	
Carcinoma mediastinum, secondary	2
Carcinoma suprarenals, secondary	6
Carcinoma abdominal glands, secondary	11
Carcinoma gland neck, secondary	4
Epithelioma, jaw and cheek	1
Carcinoma, posterior nares	1
Sarcoma, melanotic, thigh	1
left upper arm	1
Lymphosarcoma, mediastinum and gland neck	1

H.—HELMINTHIASIS

Ascaris lumbricoides	38
Ankylostomes	63
Trichiuris trichiura	16
Strongyloides stercoralis	2
Trichomonas hominis	1
Clonorchis sinensis	6
Schistosoma japonicum	6

During the year 1,872 cases passed through the Mortuary of Tan Tock Seng Hospital. These were mainly adult males, there being no beds for females in this hospital. Of these 1872 there were:—

Chinese	1,674
Indians	146
Javanese	25
Malays	12
Eurasians	6
Japanese	6
Arabs	3

Mortality figures are appended of the main causes of death, as compared with 1925, giving percentage of protocols taken.

Year	Total deaths	Total protocols	Malaria	Tuberculosis	Lobar Pneumonia	Dysentery	Beri Beri
1925	1442	620	30 or 4.8%	51 or 8.2%	66 or 10.6%	41 or 6.6%	29 or 4.6%
1926	1872	1312	230 or 17.5%	162 or 12 3%	152 or 11 7%	145 or 11.1%	79 or 6%

Of the dysenteries in 1926, there were 97 or 7·3 per cent of deaths amœbic, and 81 or 6·1 per cent bacillary.

1926 was a bad year for malaria, and tuberculosis and dysentery also showed a definite increase.

Out of a total of 1,872 cases 379 showed evidence of tuberculosis at autopsy, being 20·3 per cent. Of these 346 or 18·6 per cent showed active lesions and 33 or 1·7 per cent were quiescent. Two cases had definite tuberculous lesions of the glands of the neck; 3 tuberculous arthritis; one caries of the spine; 4 tuberculous peritonitis and 3 tuberculous meningitis.

Four hundred and eleven of 1,872 cases showed syphilitic lesions, being 21·9 per cent. Of these 113 showed definite aortitis; 19 aortic incompetence; 6 aneurysmal dilatation of the aorta; 6 definite aortic aneurysms; 7 aortic endocarditis; and 6 aortic stenosis.

A large percentage of post mortem examinations are on Coroner's cases. In the Central Mortuary in 1926, the Coroner's cases amounted to over 56 per cent, and in Tan Tock Seng Hospital to just over 10 per cent, of the total number of autopsies. The total number of Coroner's cases in 1926 was 422.

Buildings.—The new Laboratory, Sepoy Lines, was occupied during the last week in 1926. It is commodious and intended to cope with the expansion of the Pathological work.

Staff.—On May 11th, 1926, Dr. G. A. Finlayson, m.r.c.p. (London), who had for many years been Government Pathologist, and to whose untiring energy the success of the Pathological Branch is due, proceeded on three months leave prior to retirement. His duties were assumed by Dr. J. C. Tull, m.r.c.p. (London), formerly Government Pathologist, Penang.

The Staff of the Pathological Branch have continued to do excellent work during 1926, especially Dr. C. Subrahmanyam, Assistant to the Government Pathologist.

II. PENANG

Report by J. A. Cowan, m.b., b.s., *Government Pathologist, Penang.*

	1925	*1926*
	—	—
Total number of examinations made ...	49,794	54,633
Blood films.—Total number examined ...	11,209	14,875
Positive to Subtertian Malaria ...	1,427	2,078
Positive to Benign Tertian Malaria ...	346	635
Positive to Quartan Malaria	41	60
Stools.—Total number examined microscopically	13,633	13,842
Positive to Ankylostoma ova ...	2,898	5,494
Positive to Ascaris Lumbricoides ova ...	2,932	2,354
Positive to Trichocephalus Dispar ova ...	2,133	2,824
Positive to Endamœba Histolytica ...	108	142
Positive to Endamœba Coli	88	51
Total examined culturally	368	854
Positive to B. Typhosus	3	2
Positive to B. Dysenteriæ Shiga ...	6	3
Positive to B. Dysenteriæ Flexner group	7	20
Positive to Samonella group	10	29
Urine.—Total number examined	10,641	14,007
Sputum.—Total number examined ...	1,591	1,400
Positive to B. Tuberculosis	410	336

	1925	1926
Films for gonococci.—Total number examined	448	669
Positive	246	292
Films for B. Lepræ.—Total number examined	286	340
Positive	80	146
Films for Meningococci.—Total number examined	77	25
Positive	3	3
Films for B. Diphtheriæ.—Total number examined	56	81
Positive	5	15
Films for other organisms.—Total number examined	1,969	2,651
Dark ground Examinations for Spirocheta Pallida.—Total	125	136
Cultural examinations of urine.—Total ...	9	94
,, ,, *blood.*—Total ...	—	26
,, ,, *for B. Diphtheriæ.*—Total	—	32
Cultural examinations for other organisms ...	5,580	1,072
Widals.—Total number	80	61
Positive to B. Typhosus	21	7
Positive to para. *A*	—	1
Positive to para. *B*	4	1
Agglutination tests for other organisms ...	—	35
Autogenous vaccines prepared	47	38
Bacteriological Examinations of water ...	79	47
Blood counts.—Total	96	105
Blood sugar estimations	5	13
Urinary sugar estimations	—	21
Urinary albumin estimations	—	93
Sections	46	38
Wasserman re-actions.—Total	3,083	3,502
Positive	1,711	1,667
Complement fixation tests	4	8
Animal inoculations	20	28
Post-mortem examinations	333	538

Post Mortem Examinations performed in the Public Morgue during the year 1926

Chronic Malaria	3
Bacillary Dysentery	1
Leprosy	1
Pulmonary Tuberculosis	5
Tertiary Syphilis	1
Valvular disease of the heart (mitral)	1
Valvular disease of the heart (aortic)	1
Atheroma of Coronary arteries	3
Aortic aneurysm	2
Lobar pneumonia	10
Broncho-pneumonia	9
General peritonitis	1
Liver abscess	2

Hepatic cirrhosis	3
Acute nephritis	1
Chronic nephritis	2
Multiple injuries	5
Gunshot wound abdomen	1
Stab wound abdomen	2
,, ,, throat	1
,, ,, lung	1
Cut throat	1
Menigeal hæmorrhage	1
Fracture of skull	3
Rupture of spleen	1
Drowning	6
Asphyxia from hanging	7
Electrocution	1
Burns	1
Inattention at birth (hæmorrhage from cord)	1
Status lymphaticus	1
Poisoning (opium)	1
,, (postassium cyanide)	1
Decomposed	11

Post mortem examinations performed in the District and General Hospitals, Penang during the year 1926.

Malaria Benign Tertian	5
,, Subtertian	52
,, Quartan	1
,, Mixed B. T. and S. T.	2
,, Cachexia	6
Dysentery Amœbic	34
,, Bacillary	18
Pulmonary Tuberculosis	121
Tuberculous Meningitis	1
Tuberculosis Disseminated	1
Septicæmia	15
Syphilis Tertiary	6
Carcinoma cheek	1
,, liver	2
Sarcoma spleen	1
,, periosteal (rib)	1
,, neck	1
Beri-Beri	2
Pneumococcal Menigitis	1
Acute Pericarditis	3
Pleuro-Pericarditis	1
Valvular disease of the heart (aortic)	9
,, ,, ,, ,, (mitral)	10
Myocarditis	2
Arterio-Sclerosis	2
Broncho pneumonia	17
Lobar	47
Pneumonia unclassified	1
Empyema	1
Ankylostomiasis	5
Hepatic Cirrhosis	13

Liver abscess	4
General Peritonitis	1
Acute nephritis	3
Chornic nephritis	41
Sub Phrenic abscess	1
Senility	4
Multiple Injuries	4
Stab wound abdomen	1
,, ,, neck	1
Gun shot wound skull	1
Fracture of skull	4
Total ...	444

III. MALACCA

REPORT BY S. N. BARDHAN, L.M.S. (SINGAPORE), D.T.M., & H., D.P.H.,
Deputy Pathologist, Malacca.

An abstract of work done at the laboratory:—

Examination of Stools			5,112
For Ova		4,826	
Ankylostoma ova found ...	1,533		
,, ,, Roundworm ...	318		
,, ,, Whipworm ...	668		
,, ,, Whipworm and ,, ,, Roundworm ...	507		
Roundworm	142		
Roundworm and Whipworm ...	162		
Whipworm only	367		
Oxyuris	10		
Tapeworm	2		
No ova	1,112		
Examination of stool for amœba		266	
Amœba detected	39		
No Amœba detected	227		
Examination of stool for Bacillus tuberculosis (negative) ...			1
,, ,, ,, Comma bacillus (negative result) ...			7
,, ,, ,, Occult blood (positive 8, negative 3) ...			11
,, ,, ,, Sprue (negative result)			1
Examination of urine		2,946	
Routine examination for albumen, sugar, cast, crystas, pus, etc. ...	2,941		
Estimation of sugar	4		
Examination for presence of chyle	1		
Examination of Sputum		751	
Bacillus tuberculosis detected ...	163		
No Bacillus tuberculosis detected ...	526		
Pneumococcus detected ...	19		
No Pneumococcus detected ...	43		
Examination of smears for Gonococcus		449	
Gonococcus detected	161		
No Gonococcus detected ...	288		

Examination of smears for lepra bacillus			77
Lepra bacillus detected	17		
No Lepra bacillus detected	60		
Examination of smears for Diphtheria bacillus			59
Diphtheria bacillus detected	15		
No Diphtheria bacillus detected	44		
Examination of smear for Anthrax (negative result)			1
,, ,, smears for Meningococcus (negative result)			8
,, ,, ,, ,, Trypanosoma (negative result)			1
,, ,, ,, ,, Spirochæte (negative result) 3			1
,, ,, ,, ,, Mycetoma (negative result)			1
,, ,, Blood	3,609		
Examination of blood for Malaria		3,544	
Subtertian parasites detected	1,067		
Benign tertian parasites detected	379		
Quartan parasites detected	66		
Benign and Subtertian parasites detected	62		
Benign and Quartan parasites detected	17		
Subtertian, Benign tertian and Quartan parasites detected	1		
Widal reaction for typhoid and paratyphoid (negative result)	1,946		
Widal reaction for typhoid and paratyphoid (negative result)			28
Differential leucocyte count			30
Estimation of hæmoglobin			3
Examination of blood for Filaria embryo (negative result)			4
Wassermann Reaction			849
Markedly positive	254		
Positive	113		
Negative	482		
Identification of worms			1
Various cultures			14
Preparation of Vaccine and sera			5
Histo-pathological sections			50
Examination of medico-legal exhibits (mostly for human blood)			32
Chemical Analysis of water			13
Bacteriological analysis of water			32
Total number of various examinations in the laboratory			14,013
Number of post mortem examinations			48
Number of patients attending Pasteur anti-rabic treatment			26

Pasteur Anti-rabic Treatment.—There was an outbreak of rabies in Malacca and in the adjacent parts of Negri Sembilan. An anti-rabic treatment centre was opened in the laboratory on 25th April. The vaccine is prepared in Kuala Lumpur by the Pasteur Institute there and sent to Malacca as required. The patients are charged according to the fixed Federated Malay States scale. The poor are treated free.

Chemical analysis of water.—This is now done in this laboratory. Formerly samples for chemical analysis were sent to Singapore. Thirteen analyses were done this year.

Trichomonas and Strongyloides.—Eleven cases of Trichomonas in stool and 16 cases in Urine were detected this year. In 14 cases strongyloides larvæ were detected in stools. This year "Willis flotation" was the standard method of examination. Of 4,826 stools examined for ova this year, 3,026 or 83·44 per cent had ankylostoma ova, 1,134 or 23·49 per cent had roundworm ova and 1,709 or 35·39 per cent had whipworm ova. Willis Flotation is very good for examination where ankylostoma alone is looked for; an all round good method for all the likely ova in stool has yet to be found.

Ophthalmia and Conjunctivitis.—A sharp outbreak of ophthalmia broke out amongst the rickshaw-pullers and their immediate close contacts in July, and died out by December. Two hundred and sixty-two smears from the eyes were examined and Gonococcus was demonstrated in 103.

In October numerous cases of conjunctivitis came for examination; most of these cases came from local schools. About 40 smears were examined from these cases. Gonococcus was found in not a single case. In 5 cases Koch-Weeks' Bacillus was found. In the others no organism was identified—but they were clinically similar. They had received treatment before examination.

There has been no change in the staff this year. Mr. MITTRA did excellent work all through.

As in previous years the training of the estate dressers in practical laboratory work was entrusted to me and I had charge of the Dysentery and Phthisis wards of Durian Daun Hospital.

APPENDIX "D"

GOVERNMENT ANALYSTS' BRANCH

I.—SINGAPORE

REPORT BY MR. J. C. COWAP, B.SC., F.I.C., *Government Analyst, S. S.*

The following table shows the Revenue and Expenditure for the year 1926 and the Revenue collected during the preceding year.

Revenue	*1925*		*1926*	
	$	c.	$	*c.*
Fees of Office				
Petroleum Inspection	3,890	00	4,475	00
Miscellaneous	8,891	50	10,066	00
Total ...	12,781	50	14,541	00
Sale of Pyridine ...	2,747	50	3,475	50

Expenditure	*1926*	
	$	*c.*
Personal Emoluments	30,356	59
Stores from England ...	1,090	68
Miscellaneous ...	694	78
Transport ...	373	44
Calorimeter ...	725	64
Books	340	89
Total ...	33,582	02

PETROLEUM

Three hundred and forty Flash-point tests were made on 221 consignments of Kerosene imported into the Settlement and 27 tests on consignments for transhipment.

The total quantity of Kerosene imported was:—

East Indian Oil	525,219 Tins
American Oil	128,622 Tins

SHIPS' INSPECTION

Sixty-three vessels which had carried petroleum were tested for the presence of inflammable vapour before entering the harbour or docks.

OTHER PETROLEUM

Analyses of 50 samples of liquid fuel were made on behalf of the Admiralty, and one analysis was made of a sample of crude kerosene.

EXPLOSIVES

Importation.—

Eight shipments of Explosives were tested on importation to Singapore. All passed the prescribed tests.

Bombs.—

Three cases of criminal possession of bombs, etc. were dealt with.

MONOPOLIES DEPARTMENT

A. Ordinance No. 117 (Chandu Revenue).

Reports were issued on exhibits in 183 prosecutions instituted under this Ordinance.

Assays were made on 97 samples of opium or chandu seized by the Preventive Service and 61 check samples of chandu from the opium factory were assayed.

Eighty-five thousand two hundred and fifty-one tahils of chandu dross were weighed and valued on purchase by the Monopolies' department from the keepers of smoking shops and from chandu smokers.

Analyses were made on 37 samples of opium representing consignments purchased by the Monopolies' department.

B. Ordinance No. 118 (Liquors Revenue).

Determinations of spirit strength were made on 1,590 samples of liquor for Singapore and 53 samples from Malacca.

Forty samples of brandy were analysed for purposes of classification. Of these 28 were passed as genuine.

Sixty-six samples of illicit liquor were examined for the Monopolies' department or the Police.

Four samples of bhang were received for identification.

C. Other liquors.

One hundred and twenty-eight samples of other liquors were examined. These comprised samsoo, toddy, arrack, whisky, rum and dematured spirits.

D. Methylated spirit.

Thirty-four consignments, in all 1,038 drums of arrack were methylated, the total volume of spirit being 155,100 gallons.

E. Deleterious drugs.

Twenty-six samples of supposed deleterious drugs were received, of total weight 190 ozs. All these were found to be Cocaine Hydrochloride.

COUNTERFEIT COINS, ETC.

Four sets of exhibits in coining cases were received from the Police.

Only one complete coining outfit was examined. Eighty-six dollar coins and 9 fifty-cent pieces received from the Treasury were found to be genuine, although damaged by fire.

TOXICOLOGY

Forty specimens of viscera, stomach contents, washing etc. were received for analysis.

Of these 14 contained Opium, 4 contained Atropine, 2 Potassium Cyanide, 2 Tuba-root and one each Nitric Acid, Phenol, Mercuric Chloride, Phosphorus, Ammonia and Formic Acid. In 11 cases no poisons were detected.

The stomachs of two oxen were found to contain Strychnine, but no poisons were present in other cases of a dog and fowl.

In addition to the above, 49 exhibits in poisoning cases were submitted by the Police for examination and one by the Medical Department.

Chemicals and Drugs

Seventeen samples of medicinal drugs were received for analysis; one was received from H. M's Coroner the remainder from the Medical Department. Of the total 6 were Cocaine Hydrochloride, 4 were solutions of Novocaine, 2 were Chloroform, and one each were Ethyl Chloride, Carbolic Acid, Chloresal and Arsenious Oxide.

A liquid skin cure was found to contain no poison or deleterious drug.

Ores and Minerals

Twenty-nine samples of minerals were received for assay. Of these 8 were Coal and the remainder included Wolframite, Tin-Ores, Clay, Sand, etc.

Water

Analyses were made on 63 samples of drinking water and on 15 samples to be used for industrial purposes.

Milk

Fifteen samples of condensed milk and 10 of fresh milk were examined. Eight of the latter were found to be adulterated.

Urines, Etc.

One hundred specimens of urine were received from the hospital, mostly for the determination of Sugar, Acetone and Diacetic Acid.

Four specimens of Test-meals, in addition, were submitted by Medical Officers.

Miscellaneous

Reports were made on a number of miscellaneous samples. Included in these were Illipe Nuts, Cube Gambier, damaged Galvanized Iron Roofing, Asbestos Roofing, Roofing Tiles, Concrete, Cements, Plaster, Wood Preservatives, Medicines, Soya Bean Milk, Flour, Paris Green, Insect Powder, a Gold ingot etc.

Patents

Reports were made on 26 applications for Patent Rights.

II.—PENANG

Report by Mr. J. W. Haddon, B.Sc., F.I.C., *Deputy Analyst, Penang.*

The following table shows the Revenue and Expenditure for the year 1926 and the Revenue collected during the preceding year:—

Revenue	*1925*	*1926*
	$ c.	$ c.
Petroleum Inspection Fees	2,780 00	2,970 00
Miscellaneous	2,766 00	2,553 00
Certificate for Export of Petroleum ...	167 50	158 50
Total ...	5,715 50	5,681 50

Expenditure	*1926*
	$ c.
Personal Emoluments	11,020 00
Stores	409 19
Miscellaneous ...	242 41
Transport and Travelling Allowance ...	271 08
Total ...	11,942 68

PETROLEUM

Kerosene.—

One hundred and twenty-three Flash point tests were carried out on twenty consignments of kerosene imported into the Settlement, and fourteen tests on consignments for transhipment.

The total quantity of Kerosene imported was:—

East Indian Oil—14,724·46 Tonsand 3,552 tins.

American Oil—122,000 tins.

Other Petroleum.—

One hundred and eight Flash point tests were done on 35,733·74 Tons of Liquid fuel and 580 Tons of Solar oil which were imported during the year in twenty-four consignments.

Analyses were made on two samples of Lubricating oil and one of Mineral Turpentine.

EXPLOSIVES

Five consignments of Gelignite, amounting altogether to 150,000 lbs: were imported during the year. Samples from each consignment passed the prescribed tests.

MONOPLIES DEPARTMENT

A. Ordinance No. 117 (Chandu Revenue).

Reports were issued on 250 exhibits in connection with prosecutions instituted for various breaches of this ordinance.

One thousand four hundred and ninety--nine lots of chandu dross were valued on their return to the Monopolies' department by licensed smoking-shop-keepers and various private smokers. Thirty-two lots of chandu dross submitted by the Kedah Monopolies' department and sixteen lots from Perlis were assayed and valued.

B. Ordinance No. 118 (Liquors Revenue).

The alcoholic strength of 2,624 liquors was determined for the assessment of their dutiable value: of these 306 were submitted by the Kedah Customs department.

Twenty-five samples of Brandy were analysed for purposes of classification: of these eleven reached the required standard.

One hundred and eight exhibits were examined in prosecutions instituted by the Monopolies' department or the Police for breaches of this Ordinance.

Eleven lots of Bhang were received for identification.

C. Other liquors.

Seventy-two samples of Toddy were examined: of these ten samples did not conform to the special Toddy Regulations under this ordinance.

Four samples of locally distilled Samsoo were found to contain an appreciable quantity of Copper.

D. Methylated Spirit.

Eleven consignments of Javanese arrack, amounting in all to 9,000 gallons, were methylated for industrial purposes.

E. Deleterious Drugs

The only sample submitted under this head was one 1/8 ounce bottle of Cocaine Hydrochloride.

COUNTERFEIT COINS, ETC.

Three lots of exhibits in coining cases were received from the Police. They included 183 counterfeit 50 cent, 20 cent or 5 cent coins some of which were made from Britannia metal and others from Type metal. The usual plaster of Paris moulds and Silver plating appliances were also in evidence.

In connection with these cases two accused persons were examined for the presence on their clothes or persons of incriminating stains.

WATER AND SEWAGE

Chemical analyses were carried out on fifty samples of drinking water and five samples of water intended for various industrial purposes.

Four samples of Sewage Effluent were examined and reported on.

MILK

Twenty-three samples of fresh milk were analysed, of which number ten were found to be adulterated by the addition of water.

Six samples of tinned condensed Milk were analysed and reported on.

CHEMICALS AND DRUGS

Eleven samples falling under this head were received for identification and analysis. They comprised white Arsenic, Quinine Bisulphate pills, Cholorodyne (2 samples), an Indian medicine, Kruschen Salts, a patent Diarrhœa mixture, Sulphuric acid (2 samples) and Perchloride of Mercury (2 samples).

TOXICOLOGY

Six specimens of Viscera, Stomach contents, Stomach washings etc. were received for examination. Opium was found in two cases and Potassium Carbonate and Potassium Cyanide in one each.

Two exhibits submitted by the Police in a suicide case consisted of Potassium Cyanide and Borax respectively. Nothing deleterious was detected in a sample of cooked rice which was supposed to have been poisoned.

MISCELLANEOUS

One hundred and four articles were examined for chemical evidence of sea water damage.

Thirty-three samples of various substances were examined and reported on. They comprised:—

Examination for bloodstains (11 exhibits), Jelutong (3 samples), Minerals (3 samples), Carbolic Soap (5 samples), Damaged Mail Bags (2), Patchouli Leaves (7 samples), Vermin Killer, and a Deposit from a water tank.

One hundred and seventy-nine consignments of Rubber were surveyed prior to shipment and certificates issued.

STAFF

I was in charge throughout the year.

APPENDIX "E"

Extracts from The First Annual Report of the Straits Settlements Rural Sanitation Campaign, 1926, submitted by PAUL F. RUSSELL, M.D., Regular Member, Field Staff of the International Health Division of the Rockefeller Foundation.

General Plan and Scope of Campaign:—

The agreement between the Straits Settlements Medical Department and the International Health Board of the Rockefeller Foundation is for a three years' campaign to include not only hook-worm sanitation and therapy but also the development of rural health organizations under which hook-worm control as well as other health measures may be conducted.

Briefly the major strategy of the Campaign has been—

(1) to work intensively in Malacca the first year, covering the territory as thoroughly as possible and leaving a permanent organization for continuing the work;

(2) to move to the Northern Settlement early in 1927 and proceed along somewhat the same lines as in Malacca;

(3) to work in rural Singapore, Labuan, and the Dindings in 1927 or in 1928 as the opportunity is presented, the campaign in these settlements to be started along the lines of district Health Units.

Every mukim, in fact every kampong in Malacca has been visited by the Campaign staff travelling by motor car, by boat and on foot, sometimes over good roads, sometimes over very difficult ones, often across padi fields and sometimes through jungle.

The general plan of lectures and treatments will be found under the corresponding headings in Sections IV and VI below.

A special word should be said about the work on Estates and in the Municipality.

There is in Malacca a Rural Agricultural Medical Board of five physicians in whose care is the health of the rubber estates of over 25 acres. On these estates the Sanitation Campaign staff has co-operated with the respective physicians, by invitation, giving lectures in Tamil or Chinese, making Stoll examinations where not possible on the estate, and in some cases giving treatments where no estate dresser was available. On the smaller estates not controlled by the Medical Board the Campaign staff has functioned as in the kampongs adjacent to them.

In the Municipality there has been no organized co-operative campaign. But many of the school children and a number of adults have been given treatments for hook-worm or ascaris infections, treatments have been given in most of the Government departments, and a certain stimulus to health work has been given by means of the cinema, the newspaper, conferences, and the distribution of literature. The Municipality has responded by an increased interest in sanitation evidenced by the building of public latrines, and the tightening up of control over private latrines.

As regards sanitation it has been agreed as a part of the general plan of the Campaign, that the carrying out of sanitary measures shall be done not by the Campaign staff but by the ordinary Government staff under the respective Health Officers. The Campaign staff concerns itself with mass treatments for hook-worm and ascaris infections; with the active education of Government officials, school children, house-holders and others (i) as to the need for sanitation (ii) as to other phases of Preventive Medicine; and finally, with the organizing of a permanent mechanism for continuing its work when the special campaign shall have ended.

In accordance with the general policy of the International Health Board in co-operative Health ventures, emphasis in the Straits Settlements Campaign has been placed on hook-worm infection not only to bring immediate relief to the large number of persons infected but for the even greater reason that the demonstration of the hook-worm infection cycle is an ideal object lesson in Preventive Medicine, clearly understandable by all, including the kampong Malays and Tamil coolies. Thus for example, interest and sentiment has already been aroused for an active general rural health programme in the form of District Health Units as described in Section VIII below.

It is a well-established observation that the practice of Preventive Medicine requires a great deal of publicity in order to impress its lessons upon the community. This is particularly true in the Straits Settlements, and moreover in this Colony the question of how best to attract public attention and to teach the masses is one that deserves close study. For not only are there Europeans, Eurasians, and Malays but also a considerable number of individuals of all of the tribes of China and of all of the various Indian types with distinctive dialects and habits. Bazaar Malay is universal in Malaya but it consists of a relatively few, badly pronounced and rarely spelled, mercantile words not of much use in talking about malaria or hook-worm infection. Therefore unusual effort has been made during the year to inculcate Preventive Medicine ideas in these various peoples, neglecting none. The following measures have been most useful:—

1. *Lectures*—

The first lectures were in the nature of conferences with the chiefs of each Government department in Malacca, with estate managers, with the leading Chinese business men (towkays) with the leading Indians (mostly chetty estate owners) and with the Malacca Agricultural Medical Board. Addresses were given by the Director in Malay to the three district groups of Malay headmen (or penghulus). Demonstrations of eggs, larvæ and worms as well as of model latrines, accompanied these prelimary conferences and lectures.

It was then possible to give a large number of lectures to the general public throughout the territory. During the year lectures in Malay have been given at every vernacular school in Malacca and at most of the mosques, penghulus' houses, police stations and court houses. Lectures in Tamil have been given to estate coolies, public works coolies and others. Lectures in Chinese (several dialects) have been given in shop-houses, in schools, churches and other meeting places. Posters, charts, hook-worm eggs, larvæ and adults have been demonstrated at the lectures. In table number 1 will be found an analysis of the 642 lectures given to a total audience of 31,166 people

2. *Pamphlets*—

During the year illustrated pamphlets about hook-worm infection have been prepared in romanized and in Malay script, in Tamil, in Chinese, and in English. Manuscript has been written in Malayalam but has not yet been put into type. Chinese (easy Wenli) pamphlets about various subjects in Preventive Medicine have been purchased from the Council on Public Health Education of Shanghai and have been distributed widely after being passed by the local Assistant Protector of Chinese as suitable. A number of copies of Blacklock's Elementary Tropical Hygiene have been distributed to Medical Officers and to Education Department officials in the hope that more interest might be stimulated in the teaching of Preventive Medicine in schools. Unfortunately at present the Junior and Senior Cambridge Examinations do not give much emphasis to the subject and this fact is reflected in the attitude of the average school-teacher who naturally enough is chiefly concerned in preparing his charges to pass the prescribed tests.

A number of requests have come from outside sources for the Campaign pamphlets. Altogether 39,000 pamphlets have been distributed during the year.

3. *Posters*—

A series of posters illustrating various phases of Preventive Medicine are in preparation and seven have been completed. If the originals demonstrate value they will be lithographed for general distribution to schools, estates, etc.

The standard hook-worm charts of the International Health Board have been used at lectures and are being made over into a set adapted to local conditions. This series of hook-worm charts suitable for Malay schools is now ready in original form for lithographing.

In order to avoid needless duplication and to profit by the work of others complete sets of Public Health posters have been purchased from the Council on Public Health Education of Shanghai; from the Publicity Bureau of the United Provinces Health Department, India; from the Indian Red Cross Society; and from the Health Department of the Federated Malay States. Other charts have been purchased from England.

There is no question whatever that posters carefully prepared are a powerful factor in health education, particularly where so many languages and dialects abound. But a poster may as easily be misleading as not and it is astonishing how few really valuable public health posters are available in the East and how difficult it is to prepare them.

4. *Moving Pictures.*—The International Health Board's cinema "Unhooking the Hook-worm" has been used twice during the year and also two Health reels on loan through the courtesy of the hook-worm campaign in Siam.

The usual Public Health films as supplied in the United States are not suitable for use in the Straits Settlements. For example, the United States Public Health films "How Plants and Animals Cause Disease" and "How to Prevent Disease" were both shown at the Malacca Cinema Hall but were removed after one day as almost entirely unintelligible to the Asiatics. "Unhooking the Hook-worm" on the contrary was highly successful and was shown for a week. The International Health Board Malaria film on order, has not yet been received, but should be as useful as the hook-worm film.

The question of taking local moving pictures has been carefully considered and there has just come for sale in Singapore an Ernemann camera that takes standard size film but is relatively small and easily portable. Its film can be shown in cinema halls or on the portable projector described above. It is inexpensive but it is in no sense a toy and it is now on order for use in the Campaign in 1927.

5. *Special Exhibits*—

There is an organization in Malaya known as the Agri-Horticultural Association whose object is to stimulate interest in the production of more and better local fruits, grains, ornamental and useful flowers, etc. Once a year in a number of populous centres it stages an exhibition of agricultural products, Malay basketry and other arts and crafts. These shows, as they are called, are well attended by all races, and ages of both sexes so that they are ideal for public health exhibits. During the past year the Campaign staff co-operated in the preparation of an exhibit at the Malacca Show and sent posters on loan as requested to the Kuala Lumpur Show. The exhibit at the Malacca Show, in which the Health Officer and the Medical Mission also co-operated, consisted of sections on Hook-worm and other Intestinal Worm Infections; Malaria; Infant Welfare and Maternal Hygiene; and other subjects as Tuberculosis, Small-pox, Yaws, Venereal Diseases. About 5,000 people visited the exhibit.

The newly formed Infant Welfare Association of Malacca gave its first Baby Show in September. The Campaign staff assisted by supplying a number of its posters, a model layette (prepared for the Jasin District Health Unit) and by sending some of its staff to assist in demonstrations and explanations.

At the opening of the Jasin District Health Unit in December, as described below in Section VIII, the Campaign staff assisted in the preparation of special health exhibit of specimens, posters, models, layettes, etc. A permanent health exhibit has been installed at the new Jasin Hospital as a part of the district Health Unit.

V. Examinations.

1. *Stool Diagnosis*—

(*a*) General Statement.

During the year the Campaign staff made a total of 16,636 flotation stool examinations. These examinations were made for a three-fold reason, (*i*) to modify mass therapy by omitting negative cases (ii) to determine infection rates and (iii) intensity rates on a large scale.

The usual sanitary tin container was distributed for stool specimens, the half-ounce size proving more satisfactory in bringing in adequate samples than the quarter-ounce pot. It was very easy to get specimens from Malay school children and Tamil coolies but more difficult from other people. Adult kampong Malays and village Chinese are reticent about submitting specimens. Twice as many tins were given out as were returned with samples of stool.

As to method of examination, the slide count modification of the Willis flotation technique has been used chiefly. Stoll counts have been made only in selected cases. The Lane technique has been used, not for quantitative work but for checking negative flotation examinations in certain specimens. Worm counts have been done in groups of individuals.

Since actual worm counts are not feasible on a large enough scale to give a true average number of hook-worms per individual in a given area it is necessary to resort to counting hook-worm eggs in a measured amount of stool, attempting to infer from these counts the number of female worms and so the total number of hook-worms harboured by the person who submitted the sample of stool. Unfortunately female hook-worms differ in their eggs-laying habits not only from day to day but also from other females of the same species and especially from females of other species. Moreover the number of eggs per gram in a sample from one part of a stool differs from the number per gram in a sample from another part of same stool unless there has been careful stirring of the whole stool before sampling.

Thus it is evident that single egg counts in individual cases are not only worthless but may be misleadng. It is usually assumed that these fallacies counter-balance in a large series of cases.

The experience of the campaign director has been in agreement with that of many other workers in that he has found the Stoll dilution egg count the most useful method available for counting the number of hook-worm eggs in a given sample of stool.

Briefly our results point to a mushy stool factor of between 50 and 60 to convert Stoll eggs per gram into female worms, instead of the factor 25 usually accepted. They point further to a factor of about 64 which when multiplied by the 20-field count of a 2 gram specimen will give the Stoll equivalent in eggs per gram. They indicate, finally, a factor of about 1, which when multiplied by the 2 gram 20-field flotation count will give the number of female worms harbored.

In this connection it is interesting to note that Cort, Grant, and Stoll in "Researches on Hook-worm in China" (Am. Jl. Hyg. Monograph Number 7, October, 1926) state that they found a formed stool factor of 100 in a series of 50 cases where—as in Malaya—both *A. duodenale* and *N. americanus* were present. A formed stool factor is equivalent in the experience of most observers, including Stoll, to a mushy factor about one-half as great, which when divided into eggs per gram of mushy stool will give an estimation of the number of female worms harbored. This formed stool factor of 100 therefore is about equal to a mushy stool factor of 50 which is nearly equivalent to the factor of between 50 to 60 reported in the special appendix to the Third Quarterly Report of the Campaign, It is becoming increasingly apparent that the Porto Rico factors which apply in Ceylon (in a series of pure necator infections) do not apply in Malaya and that, as the authors of the Monograph cited above point out, worm factors for egg counts must be derived separately for each large geographical area where counts are being made.

It also appears that an interpolation is not always necessary, for the egg count itself has been correlated with anemia in a non-malarial region by the authors mentioned above. (*See* Table Number 7 below). Such a correlation has also been demonstrated in Malaya (where malaria and hook-worm infection co-exist) by Darling in the Report of the Uncinariasis Commission 1915 - 1917 and by Doctor BARNES (*see* the Survey Report page 54.)

It is probable, moreover, that (as suggested in the Monograph above) *A. duodenale* does about twice as much damage as *N. americanus*, that the difference in egg count factors is due to the presence of this more potent parasite, and that these two facts tend to balance. So that egg counts *per se*, from Porto Rico, for example, are perhaps comparable as a measure of the severity of hook-worm damage to the community, to those obtained in Malaya or China.

With factors available for Malaya, with a carefully standardized flotation slide count, with selected Stoll and worm counts, it is believed that a reliable intensity index has been secured during the year from a large number of cases and that a measure has been employed which future resurveys may use without difficulty. In this connection certain re-examinations have already been made which indicate the practical usefulness of the slide count flotation method. (*See* under VI below).

(*b*) Flotation methods.

The following flotation method modified from that used in the survey has been used during the past year:

1. Two grams of stool in the original tin containers is mixed thoroughly with a salt solution so well saturated that the specific gravity, frequently tested, is 1,200.

2. When the mixture is complete, the tin is filled to the brim without spilling and is capped by a 2 x 3 glass slide.

3. Not less than ten nor more than sixty minutes may elapse before examination with a Bausch and Lomb microscope using the 16 m.m. objective 10 x ocular. Boards holding 12 specimens are used so that in practice the time interval is a constant one.

4. Using a mechanical stage for convenience, twenty separate fields are counted beginning at the upper left sector of the mixture on the slide, everted deftly as in the usual Willis technique. No precise movements of the stage are required, the only precautions being that no field be counted twice and that all quarters of the specimen be included in the examination.

5. A record is kept field by field on a special form (*see* appendix) for each of the 20 fields of each specimen. The total for 20 fields is entered. If the specimen is too small to furnish 2 grams the total number of eggs counted in 20 fields is multiplied by the appropriate factor to get a corrected total on the basis of 2 grams.

6. If no hook-worm eggs are found in the 20 fields examined, then the entire slide is examined and if negative another slide also is searched. If a single egg is found in the searching the slide is marked positive and one plus.

7. On the basis of the counts and the character of the stool the specimens in Malacca have been graded as follows:

Group	*Ova Counted In Twenty Fields*	
	Mushy Stools	Formed Stools
+	10 or less	19 or less
+ +	11 to 29	20 to 59
+ + +	30 to 59	60 to 99
+ + + +	60 or more	100 or more

This grouping is the one suggested by Doctor Barnes in his special report of June 28, 1926. But as the actual count per 2 grams per 20 fields is recorded the plus-plus grouping is not essential. In Table Number 7 this plus grouping has been compared with the intensity groups of the China Hook-worm Commission.

INCIDENCE

As regards incidence, the results indicate that about 90 per cent of the Malays, 50 per cent of the Chinese, 76 per cent of the Indians and 39 per cent of the Eurasians in Malacca are infected with hook-worms. Among Malay school-boys the rate is 95 per cent. The rates for roundworm and whipworm incidence are lower. (*See* Table Number 9).

We may assume that of the general population in Malacca 20·8 per cent are free from hook-worms. About 8·3 per cent are infected with hook-worms so lightly as to be entirely subclinical. These cases are "carriers". About 39·8 per cent are in Group III. Some of the cases in this group are subclinical but many are clinically positive. It is the group in which blood losses are real but may be compensated completely. In an area like Malacca where other anemia-producing diseases are widespread this group suffers from a handicap that although small of itself may nevertheless be a real factor in producing a state of ill-health. As noted in the survey report last year, the fact that hemoglobin deficiency can not be clearly demonstrated should not blind one to the fact that perhaps *there are losses* which at the time of examination are being made good because habits and environment and freedom from other disease permit it. About 25·1 per cent are in Group IV, 5·9 per cent in Group V, both of which are clinical groups. In other words about 31 per cent of the population of Malacca are infected with hook-worms to a degree which even in the absence of other anemia-producing diseases may be shown clinically to be causing ill-health. Perhaps this is usually manifest only as a lack of energy, a hemoglobin percentage of 55 or 60 without other symptoms or signs. But 5·9 per cent are within Darling's group C with broken compensation as regards blood loss. These are frequently hospital cases. As a matter of fact, as seen in Table 19, 8·1 per cent of the admissions to hospitals in the Straits Settlements in 1926 were diagnosed *primarily* as hook-worm disease.

The results of 20-field counts on Malay schoolchildren are also shown in the table compared with the China grouping. These statistics show that 41·6 per cent of Malay schoolchildren in Malacca are in the clinical groups of hook-worm infection and 11·5 per cent are within Darling's group of broken compensation as regards blood formation.

Neither the incidence nor the intensity of hook-worm infection in Malacca has shown much geographical variation. In view of the findings of the soil survey (Table Number 13) and in the latrine survey (Table Number 21) this fact is not surprising, for soil infestation with hook-worm larvæ is widespread and sanitary latrines are rare. In Table Number 8 the geographical aspect is considered. In a total of 1,732 cases it appears that the average rural inland schoolchild harbors 41·2 hook-worms, the average rural seashore child has 31·6 and the average Malay municipal schoolchild has 38·4. The municipal Malay kampongs are not notably different from the rural kampongs in their sanitary condition. The highest average 20-field count in a school was 54·4 (Bertam Ulu, 30 examined) the lowest school average count was 9·8 (Bukit Bahru, 82 examined). No great intensity differences were noted as to sex or age. *See* Tables Numbers 2, 3 and 8.

In addition to the ova of hook-worm, round-worm and whip-worm species, ova of the following intestinal parasites were seen:—

Tænia solium	...	...	...	3 cases
Tænia saginata	...	...	...	10 ,,
Hymenolepis nana	...	...	...	4 ,,
Hymenolepis diminuta	...	...	...	5 ,,
Dipylidium caninum	...	...	...	2 ,,
Oxyuris vermicularis	...	...	...	105 ,,

Embryos of strongloides stercoralis were found only once although this parasite is not uncommon in Malacca. In the laboratory of the Government Hospital these embryos are occasionally seen in smear examinations.

C. Stoll Counts—

The Stoll dilution method of counting hook-worm ova been used in a limited number of cases. As noted in the quarterly reports and also in Section V (*a*) above, this method has not been found feasible in a large number of cases for the reasons given. The technique used has been that originally proposed without modification. The modified technique will be followed in future work, using the new dilution flasks and the smaller drop. Preliminary use of this modification indicates that it will overcome to some extent the local difficulties encountered in doing Stoll counts. The counts done during the year are presented in Table Number 11.

From the table it will be seen that the average ova count in Malaya has been 2,930 ova per gram and in Chinese 3,520 ova per gram. If we use a factor of 50 to convert these results into female worms it indicates for Malays an average total of 117·2 hook-worms and for Chinese an average total of 140·8 worms. (*See* above section (*a*) regarding the source of this factor). Most of these counts were made by dressers and all of the Chinese cases were hospital patients. The Malays were schoolchildren and prisoners.

D. Examinations by the Lane Method—

A certain number of specimens have been examined by the Clayton Lane Direct Centrifugal Flotation method using the technique as described by the author. This method has been found useful in checking specimens negative to examination by the Willis flotation technique.

The Lane method however has not been found of practical value in quantitative work. It requires sometimes as long as half a day to count a single specimen "to finality". This tediousness more than overbalances the advantage of a reduced area of examination.

E. Worm Counts—

The results of worm counts done during the year are shown in Table Number 12. The method used has been that described fully in the survey report, consisting essentially in the examination of all stools passed for a period of 48 hours after an effective vermifuge. These stools are sieved through a fine mesh screen.

The worm-count method is valuable only when there is full control over staff and patients. Such control is rarely achieved. Only within institutions like jails, boarding schools and hospitals can perfect control be approximated.

F. The Malacca Territory Infection Index—

Chandler in the Annals of Tropical Medicine and Parasitology (Vol. XIX Number 2 July 16, 1925) discusses "the Measure of Hook-worm Infection In Communities", and makes an attempt to utilize both incidence and intensity rates to produce a single infection index for a community. He points out that it is the incidence rate that is the correct measure of the extent to which the entire community has been and is likely to be exposed to infection. On the other hand it is the intensity rate or degree of infection rather than the incidence that is a rough measure of the extent rather than the incidence that is a rough measure of the extent to which individuals have been and are likely to be exposed and of the facility with which infection can occur under the climate and soil conditions of the locality, when carelessness in habits permits it.

The infection index of Chandler is derived by the following formula $I = \sqrt{\frac{\text{e.p.g}}{100} \times \%^2}$

$I =$ infection index e.p.g—eggs per gram (Stoll)
$\% =$ incidence rate ... average basis mushy stools.

In getting the e.p.g. average the entire group of infected individuals is broken arbitrarily into sub-groups according to the size of egg counts. The infection index for each sub-group is figured and then all are added together.

Assuming that the number of eggs per gram may be determined in the Malacca cases by multiplying the 20-field count by the factor 63·8, as noted above, the infection index for this Territory has been worked out in Table Number 23, as an *index of 243*. This index may be contrasted with an index of 630 worked out by Chandler (reference above) for Porto Rico where the infection is pure Necator americanus. (Chandler's index does not include a consideration of the probability that the two common species of hook-worms vary in their respective potency as causes of anemia). In a recent paper Chandler (In. Jl. Med. Research Vol. XIV Number 2 October, 1926), gives *126* as the index in Central, Western and Northern Bengal. This he terms "distinctly light".

2. *Soil Examinations*—

As noted in the Survey Report in 1925 and in the quarterly Campaign reports of this year, soil pollution in Malacca is nearly universal, not excluding the Municipality. During the survey a few soil examinations were made and hook-worm larvæ demonstrated fairly easily in the samples chosen, Occasional examinations have been made from time to time during the present year, and it has not been difficult to isolate hook-worm larvæ.

During December a systematic survey was made to determine whether or not the soils in various parts of the Territory are suitable for the development of hook-worm larvæ under natural conditions following pollution, Nineteen places were arbitrarily chosen on the map in such a way that every section of the Territory would be represented. The senior sanitary inspector in Malacca and the assistant surgeon attached to the Campaign were then sent to these spots with instructions to obtain in each place two samples of soil that had obviously been polluted. Clean cigarette tins were used to carry the soil, each sample consisting of about 210 c.c. and weighing from 150 to 314 grams.

It is interesting to note that there was no difficulty whatever in carrying out the instructions to obtain polluted soil and furthermore all samples were taken from frequented places. In other words soil pollution has been proved to be as general as was thought obvious to casual inspection.

Each soil sample after being weighed was set up in the usual modified Baermann apparatus, consisting of a piece of ordinary cotton cloth resting on 60-mesh wire gauze for support, inside a glass funnel just large enough to accommodate the complete sample. A short rubber tube attached to the funnel rod was closed with a pinch-cock and water poured in between the wire gauze and the glass of the funnel. This water registered a temperature of 115° F., care being taken to keep it at approximately this degree of warmth. The character of the soil as well as the weight was recorded, each sample having its own number. Twenty-four hours later 15 c.c. of water were run off from each rubber pipe into Lane tubes which were centrifuged for 1 minute, by minute glass making 1,000 revolutions according to the tachometer. Then all but 1 c.c. was decanted from the tube. This remainder was agitated and with a Stoll pipette 0·075 c.c. was transferred to a two by three inch slide, covered with a glass slip and examined. All of the sheathed and unsheathed hookworm larvæ and free-living nematodes seen in this specimen were counted. This method proved satisfactory for the purpose of the survey.

The examinations were made by the local director. His identification of the hook-worm larvæ was based on the following points:—

1. Characteristic and pronounced greenish sheen of the hook-worm larvæ. This was a serviceable point as the first step towards identification. But it was noted that one species of free-living nematode with well-developed ovaries and ova had a slight greenish appearance differing from the usual free-living forms seen. This species was not identified.

2. General shape of body and sheath if present. Some of the free-living nematodes were quickly recognized as such by their bulkiness. Some of the hook-worm larvæ were easily identified by the characteristic sheath which wrinkled in each concavity as the larvæ moved.

3. Cylindrical mouth cavity about as long as the diameter of the larva at the post end of this mouth cavity. Head fairly blunt. Three sections of oesophagus not sharply marked off. Reproductive primordium small.

4. Finally the character of the tail was useful, that of the hook-worm larva tapering in a uniform manner to a fine tip but not forming a long tail.

5. The movements of the larvæ seemed to be fairly characteristic.

The survey is summarized in Table Number 13. It will be noted in the table that only two samples were negative. These were from the same site, and one was grossly contaminated with fresh stool. The place was exposed to direct sun. No free-living forms are found.

3. *Hemoglobin Determinations*—

The results of hemoglobin examinations are shown in Table Number 14. All were made with a Tallquist scale by dressers under supervision at first but for the most part unsupervised.

The usefulness of the hemoglobin index as regards intensity of hook-worm infection in Malacca is limited. There is a considerable amount of malaria in the Territory, as shown for example in Table Number 15, and there are also other anaemia-causing diseases like dysentery which must be considered. Such factors as these concurrent diseases, as well as factors of age, economic status, dietary habits, and individual resistance all influence hemoglobin destruction or replacement. That hook-worm infection causes anaemia, the degree of which can be correlated with the number of worms harbored, has been clearly demonstrated as noted previously.

4. BI-MONTHLY HOSPITAL AND DISPENSARY REPORTS OF STOOL EXAMINATIONS

Statistics regarding stool examinations have been collected from each of the hospitals and dispensaries of the Colony every two months on special forms. Table 16 presents the results.

The flotation technique is routine in Government Hospitals without attempting to grade as to intensity. The total hospital rate of 40·9 per cent is lower than the general rate of 79·2 per cent found in Malacca. The Malacca hospital rate is about 10 per cent higher than the total hospital rate.

VI.—TREATMENTS

1. *Methods.*—

The campaign mass anti-hookworm treatments have consisted of both Oil of Chenopodium and Carbon Tetrachloride, given as a mixed treatment with the important exception that it became the rule during the last half of the year not to give carbon tetrachloride to:—

(*a*) Children under ten years of age.
(*b*) Tamils of any age.
(*c*) Individuals with heavy ascaris infections.

The mixed treatment consists of a maximum dose of 1 c. c. of carbon tetrachloride and 0·5 c. c. of oil of chenopodium followed by a purgative dose of magnesium sulphate. If a large number of people are waiting to be treated the two vermifuges are put into the dose of magnesium sulphate and all given together. If feasible the three drugs given separately with half hour intervals between doses.

The straight oil of chenopodium treatment has been given in a maximum dose of 1·5 c. c. Children under ten have been given this drug, the proper amount being put into the appropriate dose of caster oil and both thereby administered together. Adults are given the total dose in magnesium sulphate if large numbers are being treated. If feasible the salts are given separately one half-hour after the vermifuge.

Treatments have been given in the morning before food has been taken. Persons obviously ill from malaria or nephritis or other severe disease have been excluded from treatment. Those appearing to be weak and decidedly subnormal have been made special cases and treatment has been given in divided doses.

There is no ideal anthelmintic that will kill all hook-worms without endangering the host. Therefore a compromise must be made between efficiency and safety, and the relatively small campaign dose is an attempt to emphasize the safety factor without altogether destroying the efficiency. The dose of oil of Chenopodium (1·5 c. c.) is an efficient one and it is not believed that a large dose is justified in this campaign.

It has seemed wise not to give Tamils carbon tetrachloride because it is impossible to be sure either that they have not just had toddy or else will go right from treatment to a toddy shop for this alchoholic drink that is so popular among them. There have been one or two cases of poisoning following the administration by estate dressers of carbon tetrachloride to Tamils in which the alcoholic factor seemed to have been to blame. Moreover when the Director was in Sumatra he talked with Doctor Straub of Medan who, after sixteen deaths from dosages of carbon tetrachloride from 1·5 to 3·0 c. c. has discontinued this drug on his estates. Doctor Straub considered it possible, when questioned by the director, that there might have been an alcoholic factor in his cases.

In heavy ascaris infections it is possible that carbon tetrachloride dilutes the oil of chenopodium as regards its ascaris effectiveness and therefore in such cases it has not been given.

There seems to be evidence that carbon tetrachloride is more toxic to children in effective doses than is oil of chenopodium. Children under ten have therefore been given only the oil of chenopodium.

2. *Results.*—

No deaths have resulted from more than 22,000 campaign treatments during the year. There have been three deaths from malaria, two within two months and one within two weeks of treatment, all of which were rumoured to have been due to the mass treatment, but all of which were unquestionally deaths from malaria. None could be examined post mortem. There was one case of chronic nephritis in a Malay adult who died in hospital two months after a mixed treatment (1·0 c. c. carbon tetrachloride and 0·6 c. c. oil of chenopodium). He believed that he became ill because of the treatment for he first noted swelling of his legs three days after this treatment. It seemed clear from his history that there had been earlier episodes, and although it is possible that the treatment aggravated kidneys already diseased, this case cannot be classed as one of poisoning by the mass treatment.

It has been possible to reexamine a certain number of school children three to six months after treatment and the results are presented in Table Number 18.

It will be noted that, whereas before treatment only 5·9 per cent of the school children in the group were negative for hook-worm ova, 51·4 per cent were negative after treatment. 20·5 per cent were in the three and four plus groups before treatment and only 3·7 per cent were in these groups after treatment. The same method and the same microscopists were employed to make these examinations. Round-worm infections were present in 71·8 per cent before treatment in 49·5 per cent after treatment. The average 20-field egg count before treatment was 27·7; after treatment it was 17·2, if we exclude the negative cases each time. If the negative cases are included then the average 20-field egg count for the entire group before treatment was 26·1 and after treatment was 8·4

The Alor Gajah school was the first one treated and was also promptly provided with latrines.

The findings in this table would seem to indicate that the treatments have been worth while even in the moderate doses given. Treatments must of course be repeated yearly for at least a decade. At present in the absence of sanitation, mass treating has been "bailing with a sieve".

3. *Hospital, Dispensary and Quarantine Anti-hookworm Treatments.*

Bi-monthly reports have been collected from Government hospitals, dispensaries and quarantine stations as regards anti-hookworm treatments. (*See* appendix for form). According to these reports there have been 25,652 anti-hookworm treatments in Government hospitals and dispensaries during 1926 (up to 20th December) and 53,876 anti-hookworm treatments at the quarantine.

4. *Total Anti-hookworm Treatment in the Straits Settlements.*

In Table Number 20 are grouped all of the anti-hookworm treatments given in the Straits Settlements in 1926 of which the Campaign office could obtain a report. The total 142,063 represents a little more than one-seventh of the entire population of the Straits Settlements including the municipalities. Most of the 53,876 coolies treated in quarantine go to estates outside the Colony, however.

VII.—SANITATION

1. Malacca Territory.

The sanitation problem in Malacca is sharply divided into four parts each of which is a distinct entity.

(*a*) Government buildings in rural areas.

Government buildings in rural areas consist of police barracks, public works coolie lines, chandu (opium) shops, and Malay vernacular schools. At the beginning of the Campaign none of the 76 rural schools was provided with a latrine and very few of the other government buildings had them. Following conferences between the Resident Councillor, the Chief Medical Officer, the Health Officer and the Board's local director, a latrine census of Government buildings was ordered by the Resident, who prepared a memorandum as to needs and costs. It is pleasing to be able to report that (1) at the close of the year all Government buildings in Malacca except the schools had been provided with latrines (2) the Legislative Council of the Colony in November passed a special vote of $14,390 to build latrines at every school. This program is actively under way and over 150 school latrines are either built or building at the time of this report.

(*b*) Rural Board Gazetted Villages.

The gazetted villages are those centres of population throughout the rural area that have formally been put under the jurisdiction of the rural board and its by-laws. This board is composed of officials and unofficials and has ample powers as to sanitation, and ample funds to carry out its program. There are 20 gazetted villages, but at the beginning of the Campaign only three had conservancy systems and these three were primitive, a high percentage of householders not even using the system such as it was. Following a conference between the Resident Councillor (who is ex-officio chairman of the Board) the Government Health Officer (who is also Health Officer to the Board) and the Campaign Director, the Board voted on the 20th March to establish proper conservancy systems in each of the gazetted villages, these systems to include removal and burial of night soil, building of public latrines and the enforcement of existing ordinances by making each householder in the gazetted area build a sanitary latrine. Two villages have been cleaned this year, three are scheduled for next year and, as rapidly as possible, the full program will be put through.

(*c*) Estates.

Sanitation on estates is controlled by a very strict labour code which gives ample powers to the Health Officer as regards sanitary latrines. Active propaganda has been carried on by the Campaign as well as by the Health Officer with gratifying results. A special effort has been made to persuade estate managers to build for children latrines smaller and closer to the lines than the usual ones. Estate sanitation in Malacca is simply a matter of enforcing the existing labour code. An Assistant Controller of Labour has been stationed in Malacca during part of the year and he has been thoroughly in sympathy with the aims of the Campaign, lending the weight of his authority where needed,—on some of the chetty estates especially.

(*d*) Kampongs.

As will be seen from the survey reported in Table Number 21, sanitary latrines in rural Malacca are rarities. If we excluded village areas from the table the picture would be even worse than it appears. It is conservatively estimated that some 20,000 latrines must be built in rural areas, before sanitation in Malacca is achieved.

Compulsion in the kampongs is not feasible. The laws are not so ample as in the gazetted areas and furthermore even with the law it would still not be useful to attempt to force the householders in the kampongs to build latrines against their will. Only through an active and continuous campaign of education and house-to-house persuasion will the kampongs be sanitated. It is believed that the District Health Units will provide the mechanism for such persuasion and education. Not much progress can be reported to date but certain important preliminary steps have been taken, chief among which has been to devise an inexpensive yet durable latrines. Simple pits covered with board and attap (palm leaf) rapidly go to pieces and the natural habits of the average kampong dweller are such that they would not be rebuild. So a more permanent type of latrine has been recommended on the general pattern of the concrete-slab, pit latrine of the Southern Alabama as modified by Dr. J. I. Baeza. The Health Officer (Doctor S. W. Eveson) has succeeded in getting the cost down to a point where he can offer a concrete-slab, four uprights and cross pieces for Straits $10 including erecting, if 20 or more are built at one time in one kampong. Corrugated iron sides and top add Straits $5 to the cost.

Having brought the cost down two-thirds from Straits $30 which was prohibitive, the Health Officer will inaugurate in the new year (1927) an active campaign of persuasion. Many demonstration latrines have already been built for public use and instruction.

A mound type of pit latrine has been built where the ground water level is high. It is too early yet to report as to its usefulness but it is evident that a great deal of upkeep is required. This is difficult in the kampongs.

2. Elsewhere in the Colony there has been a considerable amount of active sanitation.

In Singapore all houses in one village have been provided with bucket latrines at Government expense in order to make a model village (Bukit Panjang). Other villages will be stimulated by education and force of law to sanitate.

Altogether 1,316 new latrines have been built in the Colony during 1926, including Malacca Territory and 259 have been repaired for sanitary reasons. This is a very small number in view of the needs but it has taken some time to get started.

The question arises as to whether or not a mass treatment campaign in the absence of adequate sanitation has been logical and useful. It seems to have been well worth the cost and efforts for two reasons:—

(1) It has reduced the incidence and the intensity of hookworm infection among those treated. (*See* above section VI and Table 18).

Hook-worm infection is slowly acquired in Malacca and therefore the intensity will not return to its former degree suddenly. These campaign mass treatments are the first of a series that will extend over a decade or more. (*See* section VIII). The campaign treatments have not caused widespread pollution of the soil. There has been no "mas diarrhœa". Furthermore special pits have been dug at places where mass treatments have been given.

(2) This mass treatment campaign has been a most valuable educational and psychological factor in preparing the people to build latrines. It is doubtful whether education, without the demonstration of real worms following treatment would ever persuade the kampong householders of the need for latrines.

It is obvious that as regards reducing the incidence and intensity of hookworm disease full value has not been received immediately and that the lack of sanitation makes reinfection almost certain. Sanitation must always precede treatment *where possible*. Unless the Government had been prepared to build and pay for 20,000 kampong latrines in Malacca it would not have been possible to sanitate in advance of the campaign, because *only through education* will these latrines be built by the householder himself and mass treatment is a definite part of that education.

VIII.—DISTRICT HEALTH UNITS

In accordance with that clause in the agreement between the Government and the International Health Board which makes one of the aims of the campaign "the development of rural health organisations under which hookworm as well as other health measures may be conducted", the campaign Director, with the approval of the Principal Civil Medical Officer and with the assistance of the Chief Medical Officer and the Health Officer of Malacca, established a District Health Unit in the Southern District, Malacca. Each of the other two districts will be provided with a similar unit early in 1927.

The District Health Unit is an extension of the Government Health Service taking the form of Rural Health Units and using chiefly the existing staff. A unit is based on a hospital district which in turn is the same as the political district throughout the Colony, so that the district, as the smallest substantial unit of government is an ideal unit for health work.

Each District Health Unit will consist of approximately the following staff: —

1 part time District Health Officer (Asiatic Assistant Surgeon in charge of district hospital);

1 full time District Health Dresser (male nurse—a vaccinator and dispenser);

1 full time District Health Nurse (Asiatic female qualified midwife and nurse);

1 or more District Sanitary Inspectors;

1 part time District Health Microscopist (will examine hospital specimens also);

1 full time coolie (caretaker and cleaner).

Among other activities it will provide a way of continuing the mass treatment of hookworm infection after the special staff of the campaign has disbanded. By persistent lectures and demonstrations the units will in time be able to persuade the kampong dwellers to build sanitary latrines. Moreover these units will be able to spot the malaria foci and outline this problem so that money already available may be spent to advantage. At present it is sometimes difficult to spend the anti-malaria vote economically because the foci of infection are not sharply defined. Observation would seem to indicate that there are such foci here as elsewhere. Vaccinations would be carried on with increasing vigor.

One of the most important phases of the work will be the infant and maternal welfare activities of the nurse.

The Southern District Health Unit began to function the first of September and was formally opened by the Resident Councillor on 15th December in the presence of all of the village headmen (penghulus and sidangs) and of the prominent Chinese (Towkays) and their families.

The program of treatments and lectures and the supervision of the unit, exclusive of sanitary inspectors, has been carried by the Assistant Surgeon (H. R. SAVARANAMUTHU) also in charge of the Jasin District Hospital.

Statistics of the Unit are shown in Table Number 22.

An important feature of the unit is a monthly conference of the entire unit staff together with the District Officer, the Chief Medical Officer, the Health Officer and the Campaign Director.

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13. Soil Survey as to Infestation with Hookworm Larvæ.
14. Hemoglobin Examinations.
15. Spleen Palpations
16. Stool Examinations in Government Hospitals and Dispensaries.
17. Campaign Antihelminth Mass Treatment.
18. Resurvey Stool Examinations following Mass Treatments.
19. Hookworm Treatments in Government Hospitals and Dispensaries.
20. Total Number of Hookworm Treatments in the Straits Settlements 1926.
21. Latrine Survey.
22. Southern District Health Unit Statistics.
23. Malacca Infection Index.

TABLE NUMBER 1 PUBLIC HEALTH LECTURES IN MALACCA BY CAMPAIGN STAFF, 1926

GROUPING	Malay	Indian	Chinese	English	Totals
Number of Lectures Grouped According to the Language of the Lecture	326	75	117	124	642
Number in Attendance at Lectures Grouped According to their Race	19,003	7,243	4,635	285	31,166

TABLE NUMBER 2 HOOKWORM INCIDENCE IN MALACCA BY RACE AND SEX

RACE	MALES			FEMALES			TOTALS		
	Examined	Positive	Percent Positive	Examined	Positive	Percent Positive	Examined	Positive	Percent Positive
Malay	8,419	7,577	90·0	1,485	1,288	86·7	9,904	8,865	89·5
Indian	2,779	2,137	76·9	1,070	795	74·3	3,849	2,932	76·2
Chinese	1,969	1,044	52·5	472	175	37·1	2,441	1,219	49·9
Eurasian	195	84	43·1	207	72	34·8	402	156	38·8
European	32	5	15·6	8	1	12·5	40	6	15·0
Total ...	13,394	10,847	81·0	3,242	2,331	71·9	16,636	13,178	79·2

N.B.—This table prepared from stool examinations in 1926 by salt-flotation technique

TABLE NUMBER 3

HOOKWORM INCIDENCE BY AGE GROUPS IN MALACCA

Age Groups	Number Examined	Number Positive	Percent Positive
0— 5 years	966	602	63.2
6—18 ,, ...	9,719	7,885	81.1
19—40 ,, ...	4,998	3,919	78.4
41—60 ,, ...	924	745	80.6
Over 60 ,, ...	29	27	93.1
Total ...	16,636	13,178	79.2

N.B.—This table is prepared from stool examinations in 1926 by salt-flotation technique

TABLE NUMBER 4

HOOKWORM INCIDENCE IN MALACCA BY OCCUPATION GROUPS

Occupation Groups	Number Examined	Number Positive	Percent Positive
Agriculture	3,954	3,232	81.7
Desk-Shop	706	407	57.6
Street	696	552	79.3
Artisan	68	50	73.5
Marine	99	76	76.8
Domestic	11,113	8,861	79.7
Total ...	16,636	13,178	79.2

N.B.—This table prepared from stool examinations in 1926 by salt-flotation technique. The occupation-grouping is fully explained in the Survey Report of 1925

TABLE NUMBER 5 HOOKWORM INCIDENCE IN MALACCA BY BIRTH PLACE AND RESIDENCE

GROUPS	Number Examined	Number Positive	Percent Positive
Foreign Born	4,219	3,214	76·2
Malaya Born	12,417	9,964	80·2
Total ...	16,636	13,178	79·2
Estate dwellers	3,712	2,735	73·7
Non-Estate dwellers	12,924	10,445	80·8
Total ...	16,636	13,178	79·2

This table prepared from stool examinations in 1926 by salt-flotation technique

TABLE NUMBER 6 HOOKWORM INTENSITY IN MALACCA BY RACE

RACE	Number Examined	Negative		One Plus		Two Plus		Three Plus		Four Plus	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Malay ...	9,904	1,039	10·5	3,864	39·0	3,428	34 6	1,162	11·7	411	4·1
Indian ...	3,849	917	23·8	2,195	57 0	572	14·9	131	3·4	34	0·9
Chinese ...	2,441	1,222	50·1	764	31·3	290	11·9	107	4·4	58	2·4
Eurasian ...	402	246	61 2	100	24·9	39	9·7	13	3·2	4	0·1
European ...	40	34	85·0	5	12·5	1	2·5	0	0	0	0
Total ...	16,636	3,458	20·8	6,928	41·6	4,330	26 0	1,413	8.5	507	3·1

N.B.—This table prepared from stool examinations in 1926 by salt-flotation slide-count technique

TABLE NUMBER 7

COMPARISON OF STANDARDS OF INTENSITY AS USED BY (1) CHINA HOOKWORM COMMISSION (2) DARLING IN MALAYA (3) STRAITS SETTLEMENTS CAMPAIGN, MALACCA 1926

GROUP	CHINA HOOKWORM COMMISSION					STRAITS SETTLEMENTS RURAL SANITATION CAMPAIGN, MALACCA 1926											
	Dilution Count E. P. G. Formed Stool	Total Hookworms E. P. G. 100 *a*	Clinical Groups	Darling's Blood loss Equivalents	China Commission Average Hemoglobin	PLUS—PLUS GROUP 2 GRAM 20-FIELD SLIDE COUNT			GENERAL POPULATION *c* BY RACE AND TOTALS (*See also Table No. 6*)				2 gram 20-field flotation Equivalent Ova Counts	MALAY SCHOOL CHILDREN		China Hookworm Commission Groups
						Class	Ova Counts	Estimated Hookworms	Race	Percent by Groups	All Exam's Percent	Percent by China Group		No. of Cases	Percent by Group	
I ...	Negatives	None *b*	Clinically	*A* Blood loss Compensated	67 1±0 8	Neg.	Neg. *b*	None *b*	Malay ... Indian ... Chinese...	10·5 23·8 50·1	20·8	20·8	Neg. *b*	208	6·1	I
II ...	1-399 mean 200	1— 3 9	Negatives		69 3±0 9	+	10 or less	20 or less	Malay ... Indian ... Chinese...	39·0 57·0 31·3	41·6	8·3	1—2	275	8·1	II
III ...	400-2,999 mean 1,700	4— 9 9	May be clinically pos.	*B* Blood balance disturbed or breaking	62 4±0 9	++	11—29	21 to 59	Malay ... Indian ... Chinese...	34·6 14·9 11·9	26·0	39·8	3—15	1510	44·2	III
IV ...	3,000-9,999 mean 6,500	30—99 9	Clinically positive	*C* Blood Compensation broken	54 9±1 0	+++	30—59	60 to 119	Malay ... Indian Chinese...	11·7 3·4 4·4	8·5	25·1	16—50	1025	30·1	IV
V ...	10,000 and over	100 or more			40 6±1 0	++++	60 or more	120 or more	Malay ... Indian .. Chinese...	4·1 0·9 2·4	3·1	5·9	51 or more	393	11·5	

(*a*) E.p.g. = Eggs per gram

Factor 100 as given in China Monograph page 16 (200 for female worms = 100 total worms)

(*b*) Light infections are sometimes missed by the dilution count method. Fewer are missed by the flotation count

(*c*) Total examined:—

Malay	... 9,904
Indian	... 3,849
Chinese	... 2,441
Others	... 442
Total	... 16,636

TABLE NO. 8.

INCIDENCE AND INTENSITY OF HOOKWORM INFECTION IN MALACCA BY GEOGRAPHICAL AREA AND ALSO BY SEX

Area	Number of Cases	Total 2 Gram 26 field Count	Average Count	Estimated Total Worms	Incidence per cent
Rural Inland ...	952	19,564	20·6	41·2	98·1
Rural Seashore ...	620	9,778	15·8	31·6	90·2
Municipality ...	160	3,064	19·2	38·4	93·3
Malay Boys * ...	306	5,826	19·0	38·0	94·6
Malay Girls ...	183	3,745	20·5	41·0	93·4

* Boys and girls from seven vernacular schools each of which is a boys' school in the morning and a girls' school in the afternoon. Environment therefore the same.

TABLE NO. 9.

ROUNDWORM AND WHIPWORM INCIDENCE IN MALACCA BY RACE

Groups	Roundworm (Ascaris lumbricoides)			Whipworm (Trichiuris trichiura)		
	Number Examined	Number Positive	Per cent Positive	Number Examined	Number Positive	Per cent Positive
Malay	9,904	7,826	79·0	9,904	7,263	73·3
Indian	3,849	1,571	40·8	3,849	1,407	36·6
Chinese ...	2,441	1,426	58·4	2,441	1,487	60·9
Eurasian ...	402	186	46·3	402	255	63·4
European ...	40	6	15·0	30	26	65·0
Totals	16,636	11,015	66·2	16,636	10,438	66·7

N.B.—This table prepared from stool examinations in 1926 by salt-flotation technique

Table No. 10.

Multiplicity of Species of Intestinal Worms Harboured by individual Hosts of various Races in Malacca

—	Malay		Indian		Chinese		Eurasian		European		Totals	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Total Individuals Examined ...	9,904	100	3,849	100	2,441	100	402	100	40	100	16,636	100
Individuals Completely Free from Ova of Intestinal Worms ...	454	4·6	487	12·7	235	9·6	78	19·4	11	27·5	1,265	7·6
Individuals with at least *One* species of Intestinal Worms ...	9,450	95·4	3,362	87·3	2,206	90·4	324	80·6	29	72·5	15,371	92·4
Individuals with at least *Two* species of Intestinal Worms ...	8,227	83·1	1,755	45·6	1,532	62·7	201	50·0	8	20·0	11,723	70·5
Individuals with at least *Three* species of Intestinal Worms ...	6,038	61·0	556	14·4	558	22·9	68	16·9	...	...	7,220	43·4
Individuals with at least *Four* species of Worms	18	0·2	3	0·1	5	0·2	...	...	...	...	26	0·2

N. B.—This table prepared from stool examinations in 1926 by salt-flotation technique.

TABLE NO. 11

HOOKWORM INTENSITY MEASURED BY STOLL DILUTION COUNTS IN MALACCA 1926

—	Number of Cases	Total Eggs Per Gram Counted	Average Eggs Per Gram	Estimated Average Number Female Hookworms	Estimated Average Total Number Hookworms
Malay	310	908,300	2,930	58·6	117·2
Chinese	149	492,800	3,520	70·4	140·8
Totals ...	450	1,401,100	3,114	62·0	124

N. B.—See explanation under Section V 1 (*a*) for conversion factor of 50 from e.p g. to female worms estimated. Factor 2 used to estimate total worms from estimated females. All cases in table were mushy stools.

TABLE NO. 12.

HOOKWORM COUNTS FOLLOWING TREATMENT, MALACCA

Race	Cases	Average Number of Hook-worms per case	HOOKWORMS EXPELLED ANALYZED BY SPECIES								Totals	
			Necator Americanus				Ankylostoma duodenale					
			Females	Males	Totals	Species Per cent	Females	Males	Totals	Species Per cent	Female	Both Sexes
Malay ...	21	96·4	963	859	1,822	90·0	125	77	202	10·0	1,088	2,024
Indian ...	3	98·0	96	114	210	71·4	40	44	84	28·6	136	294
Chinese ...	29	112·8	1,246	1,214	2,460	75·2	460	351	811	24·8	1,706	3,271
Totals ...	53	105·5	2,305	2,187	4,492	80·2	625	472	1,097	19·8	2,930	5,589

N.B.—For a more detailed analysis of some of these worm counts see the special report of Doctor MILFORD E. BARNES dated June 28, 1926 and also an appendix to the Third Quarterly Report 1926 by Doctor PAUL F. RUSSELL

Three female worms grouped for convenience in this table with ankylostoma duodenale were ankylostoma braziliensis

Sample Number	Source of Sample	Character of Soil Sample					Microscopical Examination			Free living Nematodes
		Type	Moisture	Gross Pollutien	Volume in c. c.	Weight in gram	Hookworm Larvæ			
							Sheathed	Unsheathed	Total	
1	Kuala Linggi V.S.	Humus-loam	moist	yes	210	212	1	3	4	36
2	Do.	Do.	,,	no	,,	186	3	2	5	41
3	Sungei Bahru V.S.	Laterite loam	,,	yes	,,	290	6	24	30	23
4	Do.	Sandy humus	wet	no	,,	314	2	10	12	30
5	Lobok China K.	Sand laterite	moist	yes	,,	222	4	21	25	27
6	Do.	Coarse sand with loam	,,	,,	,,	197	1	4	5	16
7	Sempang Ampat V.S.	Sandy humus	,,	no	,,	297	5	3	8	2
8	Do.	Do.	,,	yes	,,	276	4	4	8	7
9	Alor Gajah K.	Humus-loam laterite	,,	,,	,,	210	3	2	5	4
10	Do.	Do.	wet	,,	,,	228	13	6	19	28
11	Paya Rumput K.	Laterite loam	,,	no	,,	236	2	2	4	7
12	Do.	Do.	,,	yes	,,	242	1	6	7	18
13	Tanjong Kling V.S	Sandy humus	oist	no	,,	258	0	2	2	14
14	Do.	Do.	,,	yes	,,	282	3	6	9	12
15	Pengkalan Rama V.S.	Laterite humus	,,	,,	,,	238	0	1	1	17
16	Do.	Do.	,,	no	,,	221	1	2	3	5
17	Ujong Pasir K.	Humus-loam	,,	yes	,,	188	6	2	8	28
18	Do.	Do.	,,	,,	,,	202	1	4	5	13
19	Limbongan K.	Sand	wet	,,	,,	184	0	2	2	7
20	Do.	Do.	,,	,,	,,	196	1	2	3	21
21	Durian Tunggal V.	Laterite loam	moist	,,	,,	169	2	2	4	17
22	Do.	Do.	,,	,,	,,	218	5	8	13	63
23	Machap V.	Sandy humus	,,	,,	,,	261	9	11	20	21
24	Do	Do.	,,	,,	,,	279	0	3	3	50
25	Batang Melaka V.	Sandy loam	wet	,,	,,	290	1	7	8	83
26	Do.	Do.	,,	no	,,	243	1	1	2	19
27	Jasin Road 10th mile	Laterite loam	moist	yes	,,	222	0	4	4	8
28	Do.	Do.	,,	no	,,	209	1	6	7	7
29	Jasin V.S.	Do.	,,	yes	,,	218	0	0	0	0
30	Do.	Do.	,,	no	,,	200	0	0	0	0
31	Nyalas V.S.	Do.	,,	yes	,,	219	5	80	85	15
32	Do.	Do.	,,	no	,,	238	10	25	35	20
33	Chabau K.	Clay loam	,,	yes	,,	298	0	2	2	3
34	Do.	Sandy humus	nearly dry	no	,,	246	Water	spilled	...	...
35	Sebatu V.	Laterite humus	wet	yes	,,	220	0	7	7	159
36	Do.	Do.	,,	,,	,,	218	3	3	6	101
37	Umbai V.S.	Laterite loam	moist	,,	,,	169	4	14	18	97
38	Do.	Do.	,,	,,	,,	150	2	8	10	76

Abbreviation. V. S.—Vernacular School K.—Kampong V.—Village

TABLE NO. 14

HEMOGLOBIN DETERMINATIONS IN MALACCA BY RACE

(*Tallquist Scale*)

RACE	HEMOGLOBIN GROUPS									Total Number of Cases
	10 & 20	30 & 40		50 & 60		70 & 80		90 & 100		
	—	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	
Malay	0	164	4·9	1,765	53·2	1,395	41·9	0	0	3,324
Indian	0	9	0·9	77	6·9	859	77·3	166 *a*	14·9	1,111
Chinese	2	27	7·2	127	33·9	218	58·1	1	...	375
Eurasians	1	3	...	91	42·7	117	54·9	1	...	213
Totals ...	3	203	4·1	2,060	41·0	2,589	51·5	168	3·4	5,023

N.B.—These determinations were made by dressers using Tallquist scales. The Indians marked (*a*) are employed by the Government Survey Office. They live in the Municipality, are very well nourished and are not subject to overwork or exposure.

TABLE NO. 15.

SPLEEN PALPATIONS MALACCA SCHOOL-CHILDREN 1926

——	Number	Percent	Per cent by Groups	Per cent by Groups	——
Cases Examined	1,305	100	100	100	Cases examined
Total Positive Spleens	562	43·1	43·1	43·1	Total Positive Spleens
Total Negative Spleens	743	56·9	56·9	56·9	Total Negative Spleens
Palpable on Inspiration	307	23·5	23·5	32·1	Palpable on Inspiration
Palpable	112	8·6	11·6		Palpable
1 Finger's breadth	39	3·0		8·8	1 Finger's breadth
2 Fingers' „	45	3·4	5·4		2 Fingers' „
3 „ „	26	2·0			3 „ „
4 „ „	4	0·4	2·6		4 „ „
Umbilicus	16	1·2		2·2	Umbilicus
Pelvis	13	1·0			Pelvis

N.B.—All palpations on children under 14 years of age

School with highest rate—Kemuning Vernacular School, 33 examined, rate 94·0 per cent

„ lowest „ —Bukit Bahru „ „ 82 „ „ 9·7 „

TABLE No. 16.

STOOL EXAMINATIONS IN ALL GOVERNMENT HOSPITALS AND DISPENSARIES THROUGHOUT THE STRAITS SETTLEMENTS 1926

—	Stools Examined	Stools Showing Hookworm Ova	Per cent Positive
Hospitals ...	50,253	20,446	40·7
Dispensaries	703	503	71·6
Quarantine	11	2	18·2
Totals ...	50,967	20,951	41·1

TABLE No. 17.

CAMPAIGN MASS WORM TREATMENTS DURING THE YEAR 1926 MALACCA

Race	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Malays ...	399	4,218	7,048	6,241	17,906
Chinese ...	22	241	276	1,631	2,170
Tamils ...	352	754	132	414	1,652
Eurasians ...	31	52	19	331	433
Europeans ...	1	2	1	2	6
Bengali ...	...	...	5	8	13
Japanese ...	...	...	1	...	1
Javanese ...	...	...	1	...	1
Singhalese ...	...	...	2	7	9
Malabari ...	...	...	3	...	3
Totals ...	805	5,267	7,488	8,634	22,194

TABLE NO. 18

RESURVEY EXAMINATIONS IN VERNACULAR SCHOOLS FOLLOWING ONE CAMPAIGN TREATMENT

—	FIRST EXAMINATION		SECOND EXAMINATION	
	Number	Per cent	Number	Per cent
GROUP 1				
Malay Vernacular School ...	18	...	18	...
Pupils Examined	1,407	...	1,238	...
Hookworm Negative	83	5·9	636	51.4
One plus	511	36·4	378	30·5
Two plus	524	37·2	178	14·4
Three plus	230	16·3	32	2·6
Four plus	59	4·2	14	1·1
20-field Hookworm Egg Counts ...	1,407	...	1,238	...
Average Count Negatives excluded	27·7	...	17·2	...
Average Count Negatives included	26·1	...	8·4	..
Roundworm *Negative* ...	397	28·2	626	50·5
Positive ...	1010	71·8	612	49·5
Hemoglobin Average 3 Schools ...	174	59·9	252	66·5
GROUP 2				
Alor Gajah, Vernacular School,				
Pupils Examined	79	...	85	...
Hookworm Negative	...	...	28	32·9
One plus	33	41·8	40	47·2
Two plus	25	31·7	10	11·7
Three plus	8	10·1	7	8·2
Four plus	13	16·4	...	...

N.B —In all cases at least three months intervened between treatment and second examination. In some cases, as in Alor Gajah School, six months had elapsed.

TABLE NO. 19

HOOKWORM DISEASE AND TREATMENT IN STRAITS SETTLEMENTS GOVERNMENT HOSPITALS, DISPENSARIES AND QUARANTINE STATIONS 1926

—	Total Treatments all Cases	CASES DIAGNOSED AS HOOKWORM DISEASE		Anti-hookworm Treatments
		Number	Per cent	
Hospitals	48,125	3,991	8·1	17,536
Dispensaries	79,082	2,161	2·6	8,116
Quarantine	...	...	...	53,876
Total ...	127.207	6,152	5·0	79,528

TABLE NO. 20

TOTAL NUMBER OF ANTI-HOOKWORM TREATMENTS STRAITS SETTLEMENTS 1926

Sanitation Campaign, Malacca	22,194
Quarantine Camps	53,876
Government Hospitals and Dispensaries	25,652
Estate Coolies and School children Treated by Government Medical Staff (exclusive of Malacca)	17,287
Malacca Agricultural Medical Board (No report from 1 of the 5 physicians)	23,056
Total Number of Anti-hookworm Treatments reported to the Campaign Office	142,063

Campaign Treatments are totals for the year but all others are up to 20, December only

TABLE NO. 21

LATRINE SURVEY IN MALACCA 1926

	Number	*Per cent*
	—	—
Villages surveyed	31	...
Houses „	3,390	...
Houses with Sanitary Latrines	226	6·7
Houses with Unsanitary „	699	20·6
Houses with no latrines	2,465	72·7
Population surveyed	13,729	...
Malays	7,391	53·9
Chinese	5,955	43·4
Indians	355	2·6
Others	28	0·1

Survey reported in detail in Third Quarterly Report

TABLE NO. 22

SOUTHERN DISTRICT HEALTH UNIT STATISTICS, SEPTEMBER TO DECEMBER, 1926

——	Malay	Chinese	Indian	Others	Total
Lectures	294	26	13	3	336
Attendances	3,006	1,294	331	42	4,673
Treatments	2,688	98	334	4	3,124
Households visited by Health Nurse	190	59	11	0	260
Deliveries by Nurse	4	...	...	...	4

The Health Nurse made a total of 613 visits to the 260 houses listed above

TABLE NO. 23

MALACCA TERRITORY INFECTION INDEX

—	2 gram 20-field Count Average	Equivalent Eggs per gram (factor 63·8)	$\frac{E.P.G.}{100}$	INCIDENCE PERCENT		$\frac{E.P.G.}{100} \times \%^2$	$\sqrt{\frac{E.P.G.}{100} \times \%^2}$
				Actual	Squared		
+	5	319	3·2	41·6	1,731	5,539	74
+ +	20	1,276	12·8	26·0	676	8,652	93
+ + +	44	2,807	28·0	8.5	72	2,016	45
+ + + +	150	9,570	95·7	3·1	10	957	21
						Total equals Infection Index	243

e. p. g. = eggs per gram dilution count

Chandler's formula

$$\text{Index} = \sqrt{\frac{e.\,p.\,g.}{100} \times \%^2}$$

APPENDIX "F"

TAN TOCK SENG HOSPITAL, SINGAPORE

REPORT BY E. D. LINDOW, M.R.C.S., L.R.C.P.

1. Work done.

Remained on 31st, December, 1925	853
Admitted during 1926	17,118
	17,971
Discharged	15,292
Died	1,736
Remained on 31st December, 1926	943
	17,971

2. The average daily sick was 923·52 compared with 751·05 in 1925.

3. The percentage of deaths to total treated was 9·66 per cent compared with 10·12 per cent in 1925.

4. The total number of deaths was 1,736, of these 395 died within 24 hours of admission. Deducting these the death-rate was 7·46 per cent.

5. *Malaria.*—There was an enormous increase in this infection, the numbers rising from 2,467 in 1925 to 5,848 during the ensuing year. Of these 367 died giving a death-rate of 6·27 per cent compared with 8·26 per cent the previous year. One hundred and forty-three cases died within 24 hours of admission; deducting these the death-rate becomes reduced to 3·83 per cent.

Type of Malaria	*Cases treated*	*Deaths*
Benign Tertian	573	11
Sub-tertian	3,091	305
Quartan	130	4
Mixed infections	470	42
Chronic	575	5
Unclassified (Clinically Malaria) ...	1,009	—
	5,848	367

Blood examination is adopted in all cases of fever and the total number of specimens examined gave the following results:—

Sub-tertian	3,365
Benign tertian	770
Quartan	172
Mixed	675
Negative	5,782
	10,764

Causes of death in Malaria Cases:—

Coma	117
Cardiac failure	112
Hyperpyrexia	39
Liver failure	29
Cachexia	48
Enteritis	9
Nephritis	4
Pneumonia	6
Ruptured spleen	2
Abscess spleen	1

Seasonal Incidence.—The records showed very much what is to be expected, only with much greater intensity. From January until April the approximate numbers of monthly admissions was 250. In May they went up to 747, June 813, July 704, August 521, followed by a steady decline until December when 418 patients were admitted.

This great increase in May, June and July may be explained by the long continued hot weather and also by the large number of admissions from neighbouring states.

6. *Dysentery.*—Six hundred and fourteen cases were treated, of which 207 died, a death-rate of 33·71% compared with 35·46% in 1925.

Type of Dysentery	*Cases treated*	*Deaths*
Amœbic	274	86
Bacillary	292	121
Chronic	15	—
Mixed	3	—
Unclassified	30	—
	614	207

7. *Beri-beri.*—The numbers again increased from 623 to 689, with 114 deaths, giving a percentage death-rate of 16·54% compared with 12·03% the previous year. It is a significant fact, that 55, or almost half of the patients who died, had not been in hospital twenty-four hours.

Comparative figures:—

	1920	*1921*	*1922*	*1923*	*1924*	*1925*	*1296*
Cases	136	297	730	483	416	623	689
Deaths	14	75	107	64	77	75	114
Mortality	10%	22·25%	14·57%	13·25%	18·50%	12·03%	16·54%

8. *Enteric Fever.*—Fifty-one cases were treated with 24 deaths, a percentage of 47·5% compared with 52·17% the previous year.

9. *Pneumonia.*—The number of admissions was almost double that of the previous year; the total being 419 with 219 deaths. Three hundred and fifty-one were of the lobar type with 165 deaths giving a percentage rate of 47·0%, while 65 were of the broncho type with 54 deaths, giving a death-rate of 79·4%.

10. *Venereal Diseases.*—One thousand six hundred and thirty-five cases were treated compared with 1,736 the previous year, with 34 deaths.

	Cases	*Deaths*
Congenital Syphilis	1	—
Syphilis Primary	215	—
,, Secondary	578	—
,, Tertiary	107	34
Chancroid and Bubo	360	—
Gonorrhœa, urethritis	156	—
,, and other manifestations ...	218	—
	1,635	34

Dr. W. M. Chambers, Chief Medical Officer, Social Hygiene, assumed charge of this side during the year, visiting the hospital daily: the results obtained have been much improved. As usual modern methods of treatment were in vogue, while the great increase in the number of arsenical injections given, and the variation in treatment adopted, testifies the increased efficiency of this side.

The principal drugs used with the number of injections was as follows:—

N. A. B.	567
Neo Salvarsan	1,687
Sulpharsanol	376
Bicreol	1,176
Novarsan	173
Calomel Cream	104
Tartar Emetic	294
Contramine	82

11. *Helminthiasis.*—All stools of patients are examined microscopically on admission, with results appended.

Ankylostoma Ova	4,825
,, and round worm Ova	689
,, and whip worm Ova	601
,, round worm and whip worm Ova ...	265
Round worm Ova	1,277
,, ,, ,, and whip worm Ova ...	271
Whip worm	980
Amœbic	67
Negative	6,988
	15,973

Percentage of infection with:—

Ankylostoma	40·0 %
Round worms	19·42%
Whip worms	12·25%

The total number of stools examined, including repeated examination was 17,369, as follows:—

Ankylostoma Ova	5,251
,, and round worm Ova	733
,, and whip worm Ova	678
,, round worm and whip worm Ova ...	280
Round worm Ova	1,349
,, ,, and whip worm Ova	297
Whip worm Ova	1,074
Amœbæ	67
Negative	7,640
	17,369

12.—*Ankylostomiasis.*—There were 736 cases in which this infection was the principal disease, with 7 deaths, giving a percentage death-rate of 0·95% compared with 1·70 in 1925.

Treatment.—Carbon Tetrachloride was used generally, as a routine and the figures of treatment are as under:—

	Cases treated	*Average number of Worms*	*Cure*
	—	—	—
One dose Carbon Tetrachloride ...	1,668	10·6	71·8%
Two ,, ,, ,, ...	114	37·1	84·3%
Three ,, ,, ,, ...	17	43·0	85·7%
Four ,, ,, ,, ...	6	75·3	90·0%
One dose Ol Chenopodium ...	20	6·0	68·4%
Mixed Ol Chenopodium and Carbon Tetrachloride	12	27·4	81·2%
Ol Chenopodium one and Carbon Tetrachloride one	8	9·5	78·0%

13. *Tuberculosis.*—The number of admissions dropped from 831 to 652 with 311 deaths, giving a percentage death-rate of 47·69% compared with 40·31% in 1925.

14. *Ulcers.*—One thousand five hundred and twelve cases were admitted: the condition remains as intractable to treatment as formerly experienced. All recognized methods of treatment were adopted, and continous eusol irrigation appeared to give the best results.

15. *Plague.*—One case, bubonic, was transferred to the Middleton Hospital.

16. *Medico-legal.*—One hundred and nineteen cases were sent by H. M. Coroner for post mortem examination, and 27 died on their way to hospital. One thousand seven hundred and thirty-one accident or assault cases were brought by the Police for treatment. Two hundred and four cases were sent for observation for insanity, of which 118 were certified.

17. *General.*—To combat the great increase in the number of admissions, two temporary wards were erected, each accommodating 56 patients. The sanitary condition was very satisfactory, and the water supply improved by the installation of larger pipes, thus rendering the hospital independent of the pump engines.

18. *Dressers.*—Though the staff of the department was increased, there were ample applicants for vacant posts. The results of examinations were:—

Passed for Grade II	6
Passed for Grade III	13
Passed for Special Laboratory Course	8
Passed for Special Post Mortem Course	8

19. Dr. E. D. LINDOW was in charge throughout the year. The surgical duties were performed by Mr. K. BLACK, F.R.C.S. (England), Mr. A. D. WRIGHT, M.S., F.R.C.S., and Mr. J. A. W. EBDEN, M.D., M.S., F.R.C.S.

Miss INNES was appointed Matron in August.

APPENDIX "G"

TREATMENT OF SCABIES BY THE DANISH METHOD

A return of uncomplicated cases of Scabies treated by the Danish Method in hospitals and dispensaries in the Straits Settlements, during 1925, is attached.

Conclusions are:—

(1) That most sufferers are cured by a single application.

(2) That the method does not require so much attention to detail as the Sulphur Ointment treatment.

(3) That these considerations render it specially suitable to outdoor cases who will probably only make one attendance at a dispensary.

(4) That in cases treated as in-patients the time spent in hospital is reduced to half (average about 5 days, instead of over ten with Sulphur Ointment treatment).

SCABIES IN-PATIENTS TREATED BY THE DANISH METHOD

	Total number treated	*Cure first application*	*Cure 2nd application*	*Cured number of applications not stated*	*Left before cured*
	—	—	—	—	—
Government Hospitals ...	201	113	37	16	35

2. Treated in Out-door Dispensaries including Travelling Dispensaries—2,145.

Very few of these cases returned a second time: it may be hoped that the majority were cured by a single application.

APPENDIX "H"

REPORT ON THE TREATMENT OF OPIUM HABIT

I.—SINGAPORE

REPORT ON PATIENTS RECEIVING TREATMENT FOR OPIUM HABIT DURING 1926 BY DR. E. D. LINDOW, M.R.C.S., L.R.C.P.

OPIUM HABIT.—

Remained on 31st December, 1925	24
Admitted during 1926	1,514
	1,538
Unfit for treatment	5
Absconded	915
Discharged, apparently cured	589
Remaining 31st December, 1926	13
	1,522

The number of genuine cases seeking admission was much reduced compared with the previous year and the beds were reduced from forty to twenty. The same lines of treatment were adopted, but the results obtained were disappointing, as three-fifths of the patients absconded, and of the others very few exhibited any real distress following eradication of the drug. Ten patients were admitted twice and two patients three times.

II.—PENANG

REPORT ON ANTI-OPIUM TREATMENT BY W. A. TAYLOR, M.B., Ch.B.

Thirty beds have been reserved for the treatment of sufferers from Opium Smoking during the year.

Eight hundred and sixty-six patients were treated and of whom 161 were cured, 675 discharged, 22 absconded and 8 remained.

III.—MALACCA

REPORT ON ANTI-OPIUM WARDS BY H. G. HOLDBROOK, M.B., Ch.B.

Anti-Opium Treatment.—Facilities for anti-opium treatment were provided, and were made known with the help of the Assistant Protector of Chinese, but only a few took advantage of them.

The total number treated during 1926 was 118. Of these only 10 completed the course. No information is available regarding the history of the patients who had anti-opium treatment last year, but in my opinion, most of the patients took the treatment for the sake of a "Rest Cure" or in order to reduce their consumption of opium for financial reasons. Genuine cases who have really been cured do exist, but they are very few.

APPENDIX "I"

OUT-PATIENTS TREATED DURING THE YEAR 1926, AT THE WOMEN AND CHILDREN'S DISPENSARY, KANDANG KERBAU, SINGAPORE

REPORT BY MRS. C. H. DUKE, M.B., D.P.H.

The number of patients treated during the year was as follows:—

New patients	*Repetitions*	*Total*
12,767	19,480	32,247

The corresponding figures for 1925 were:—

New patients	*Repetitions*	*Total*
9,701	17,203	26,904

Nationalities.—

Chinese	8,811
Indians	1,658
Eurasians	1,000
Malays	903
Jews	220
Japanese	99
Others	76
	12,767

Venereal Disease.—

There were 855 cases of venereal disease with 5,011 attendances at the ordinary dispensary.

These cases consisted of—

Syphilis	307
Congenital Syphilis	45
Gonorrhœa	485
Gonorrhœal Ophthalmia	18
	855

There was also a special clinic for prostitutes with 372 cases and 694 attendances.

Of these—Syphilis	47
Gonorrhœa	202
No signs of V. D.	123
	372

The number of Injections given for Venereal Disease were:—

N. A. B.	60
Stabilarsan	621
Sulfarsenol	108
Gonococcal Vaccines	108
	897

Fevers.—

There were 362 cases of Malaria as against 132 for 1925:—

Benign Tertian	274
Sub-tertian	87
Quartan	1
	362
Unspecified	579
Total	941

Phthisis cases numbered	54
Microscopical Examinations	2,917

APPENDIX "J"

REPORT BY PROFESSOR J. S. WEBSTER, D.M.R.E., M.B., RADIOLOGIST, SINGAPORE

The work of the department during the year shows a great increase in all the branches: this is especially so as regards radiography, 4,747 radiograms being taken as compared with 3,552 in 1925.

Despite the increase, there is still room for the collection of more work and it is expected that more advantage will be taken of the departmental activities when the new apparatus arrives. The present increase has necessitated further assistance and on September 1st, Sister THOMAS was posted for duty. It also rendered the previous accommodation inadequate, but fortunately the Theatre Block of the New Hospital was completed on September 4th, and the new suite of rooms was occupied.

The following list indicates the more interesting work undertaken during the year:—

Examination of the Gastro-intestinal canal after the administration of a Barium meal ...	221 cases
Examination of the Colon after the administration of a Barium Enema	19 ,,
Radiographic examination of the Urinary Tract ...	180 ,,
Radiographic examination of the Thorax and contents	146 ,,
Radiographic examination of the Pelvis and its organs	54 ,,
Radiographic examination of the Skull, face with Sinuses	165 ,,
Radiographic examination of the Spine ...	53 ,,
,, ,, ,, Oesophagus ...	8 ,,
,, ,, ,, Gall-bladder ...	16 ,,

Radium

The equipment of a modern Hospital is incomplete without the purchase of at least 100 milligrams of Radium.

Its chief use is in the treatment of Malignant Disease but it can be employed with benefit in the treatment of many non-malignant conditions: *e.g.*, Fibromyomata of the Uterus, Leucocythæmia, Exophthalmic Goitre, Tuberculosis of the Skin and Lymph. Glands, Nævi, Keloids, Lupus Erythematosis, Leucoplakia, Warts, Keratomata, Papillomata, Chronic Eczema, Psoriasis, Lichenification and Pruritis.

The extent to which it will be used depends chiefly on the experience and enthusiasm of the Surgeon and Skin Specialist under whose care the cases suitable for Radium Therapy will come.

In capable hands Radium will give results well worth the initial expenditure but a word of warning should be uttered against its indiscriminate use by either the inexperienced or the ignorant.

The supply once obtained is practically everlasting as it only falls to half value in 1728 years.

During the year, the radiographic examination of the Gall-bladder after the intravenous injection of Sodium Tetraiodophnolphthelein by the method introduced by Graham, was commenced and has proved to be of considerable value in the elucidation of the condition of this organ. Several pyelograms were also taken at the request of the Surgeons, who also took advantage of the help afforded by the X-rays in the extraction of foreign bodies in 19 instances.

As regards X-ray Therapy an increase in the cases treated is to be noted: the disease so treated range from Uterine Fibroids to Tinea of the Scalp. Seven cases of the former condition were treated with excellent results in 6 and satisfactory progress in the 7th. The treatment of Asthma by radiation was attempted but the results were not encouraging; a further trial will be made when the new apparatus has been installed.

Considerable use has been made of the diathermy machine, both for medical and surgical conditions with satisfactory results in all the cases treated.

Dr. R. B. MacGregor was in charge till July 4th, 1926 when Dr. J. S. Webster returned from leave and took over the department.

APPENDIX "K"

I.—MEDICAL INSPECTION OF ENGLISH GIRLS' SCHOOLS, SINGAPORE

Report by Inspector of Girls' Schools (Dr. C. H. DUKE, M.D., D.P.H.)

Number of schools examined during the year:—

1. The Raffles Girls' School.
2. The Singapore Chinese Girls' School.
3. The French Convent School.
4. The Saint Anthony's Convent School.
5. The Methodist Girls' School.
6. The Fairfield Girls' School.

Visits.—The number of pupils numbered 2,586.

The children of each school were examined twice during the year, and two visits of inspection were made to the school premises.

Vaccination.—Thirty-one per cent of the school children required re-vaccination. The majority of these were successfully re-vaccinated at school, and the complete staff and scholar numbering 143, of the Nan Hua School in Bencoolen Street were vaccinated when a case of small-pox broke out in that school.

Developments since 1925 Inspection.—

1. *General Nutrition.*—This has much improved in all the schools during 1926.
2. *Clothing.*—The number of children with *insufficient* or *dirty* clothing has also been reduced.
3. *Pediculi Capitis and Nits.*—This condition on the whole remains much about the same, 6 per cent of the children having these as compared with 5½ per cent last year.
4. *Skin Diseases.*—Generally these show practically the same percentage as last year, namely 10 per cent. Fairfield and Raffles Girls' Schools show a big improvement of 50 per cent.
5. *Defective Vision.*—Sixty-seven per cent of those with defective vision had their eyes attended to and glasses supplied. In 1925, 72 per cent had their eyes attended to.
6. *Teeth.*—This condition shows the biggest improvement. Thirty-four and a quarter per cent have attended the dentist (where extractions, fittings, etc., are done for nominal charge) as compared with only 14 per cent for 1925.
7. *Sanitation.*—Generally there has been an improvement during 1926. The Methodist Girls' School has improved its drinking and washing facilities. Saint Anthony's Convent now provides filtered water for all the classes and the bathrooms and latrine floors and walls have been tiled. The French Convent has adopted municipal water generally, and all the wells there have been closed. Eight extra latrines are in the course of construction for day scholars.
8. *Food.*—This still remains a problem. Hawkers should not be allowed in the school grounds. Instead of giving money to spend on unsuitable eatables, the parents should be encouraged to provide their children with a light lunch for recess time.
9. *School hours.*—The hours at all the schools are now from 8 A.M. to 1 P.M. except at the French Convent where the hours are still from 9 A.M. to 3 or 4 P.M., making much too long a day. Religious Instruction is given there in the afternoons but as this

is also given at most of the other schools there is no reason why the general hours of 8 A.M. to 1 P.M. should not be adopted here too.

10. *Medical Attention.*—This is still unsatisfactory. Fairfield School was most assiduous in having defective conditions attended to, especially skin diseases, which resulted in an improvement of 50 per cent for the year. Eyes and Teeth have been on the whole well attended to but generally little attention has been paid to other conditions.

Particulars are attached.

II ANNUAL REPORT FOR 1926 ON BOYS' SCHOOLS IN SINGAPORE,
BY DR. K. C. GHOSH, ASSISTANT HEALTH OFFICER, SCHOOLS, SINGAPORE

1. Number of Boys examined:—

(*a*) English Schools—

(1) Victoria Bridge School	713
(2) Geylang English School	412
(3) Rangoon Road School	380
(4) Saint Joseph Institution	1,518
(5) Paya Lebar English School	169
(6) Teluk Kurau English School	12
(7) Gan Eng Seng English School	460
Total ...	3,664

(*b*) Malay Schools—

(1) Kampong Glam Malay School	216
(2) Rochore Malay School	159
(3) Kampong Rokok Malay School ...	140
(4) Gaylang Malay School	173
(5) Tanjong Katong Malay School ...	44
(6) Teluk Kurau Malay School	152
(7) Siglap Malay School	89
(8) Pandang Terberker Malay School ...	48
(9) Beting Kusah Malay School	49
(10) Pulau Tekong Malay School	34
(11) Tanglin Kechil Malay School	173
(12) Tanglin Besar Malay School	109
(13) Sepoy Lines Malay School	48
(14) Teluk Blangah Malay School	59
(15) Kampong Jagoh Malay School ...	45
(16) Pasir Panjang Malay School	59
(17) Teluk Saga Malay School	77
Grand Total ...	5,338

2. General condition.—

	1925		*1926.*	*1926 number examined.*
Good	78%	Good ...	81%	4,384
Fair	13·3%	Fair ...	11·3%	691
Poor	11·1%	Poor ...	3·7%	263

3. *Cleanliness.*—All Headmasters have been instructed to see that the boys have a bath before coming to school, otherwise they should be either bathed in school or sent home for a bath; that the nails are cut short; hair well-kept; and clothes clean. There are few cases of dirty children in school, as is well demonstrated by a comparison of condition in the Gan Eng Seng School.

	1923		*1926*
Dirty	21·76%	Dirty	7·82%

4. *Vaccination.*—The vaccinator attached to the Health Branch visited the schools examined by me and vaccinated or re-vaccinated 3,260 pupils as compared with 1,162 in 1923.

5. *Eye-sight.*—(1) Defective Vision and (2) Diseases of the Eye proper. The total number examined was Defective Vision 268 cases, Diseases of the Eye 217 cases. The tabulated charts show the number of cases in each school and class. The Pupils with defective vision were asked to consult Mr. K. Black, Oculist, General Hospital for detailed examination, and to buy glasses outside. Under the second category were (*a*) Trachoma 80 cases (*b*) Follicular Conjunctivitis 103 cases, (*c*) Squint or Strabismus 13 cases (*d*) Blepharitis 21 cases. Besides there were a few cases of Leucoma, Displaced Lens, and complete loss of vision in one eye. These cases were sent for treatment either to the General Hospital or to an Out-Door Dispensary.

6. *Dental Caries.*—About 69 per cent of the boys are suffering from this disease.

A Dental Surgeon (Mr K. Homma) has arranged to treat children with caries at reduced rates—see list attached. The number of boys examined for dental caries were: —

1925—2,791 boys—1,323 caries—47 per cent.

1926—5,338 boys—3,340 caries—62·6 per cent.

7. *Sanitation.*

Visits to schools.—The number of visits was 139. In 1925 the number was 26. The following schools were visited and reports were furnished to the Chief Health Officer or to the Inspector of Schools.

(1) *English Schools.*

(*a*) Outram Road School.

(*b*) Victoria Bridge School.

(*c*) Raffles Institution.

(*d*) Pearls Hill School.

(*e*) Geylang English School.

(*f*) Rangoon Road School.

(*g*) St. Joseph Institution.

(*h*) Paya Lebar English School.

(*i*) Gan Eng Seng Free School

(*j*) St. Andrew's School.

(*k*) St. Anthony's Boys School.

(2) *Malay Schools.*—The reports and recommendations were written in the Diary of the School and the Inspector of Schools informed—

(*a*) Kampong Glam Malay School.
(*b*) Rochore Malay School.
(*c*) Kampong Rokok Malay School.
(*d*) Geylang Malay School.
(*e*) Tanjong Katong Malay School.
(*f*) Teluk Kurau Malay School.
(*g*) Siglap Malay School.
(*h*) Pandang Terberker Malay School.
(*i*) Beting Kusah Malay School.
(*j*) Pulau Tekong Malay School.
(*k*) Tanglin Kechil Malay School.
(*l*) Tanglin Besar Malay School.
(*m*) Sepoy Lines Malay School.
(*n*) Telok Blangah Malay School.
(*o*) Kampong Jagoh Malay School.
(*p*) Pasir Panjang Malay School.
(*q*) Teluk Saga Malay School.

(3) *Private Schools.*

Reports were sent to the Inspector of Schools.

(*a*) Oldham Hall Boarding School.
(*b*) River Valley Road Private School.
(*c*) The Christian School.
(*d*) Katong Chinese School.
(*e*) Miss Gomes School.
(*f*) Mrs. Le Mercier's Private School.
(*g*) Mrs. A. B. Edwards School.
(*h*) Mrs. E. S. Smith's School.
(*i*) Alsagoff Arab School.
(*j*) Pasir Panjang School.
(*k*) The Plainfield School.
(*l*) The Indian Elementary School.
(*m*) Dutch Preparatory School.
(*n*) The Elementary English School.
(*o*) Arabic Islamic School.
(*p*) Practical Double-Rate English School.
(*q*) Royal English School.
(*r*) The Mercantile Institute.
(*s*) The Primary English School.
(*t*) The Yang Chee School.

8. *Infectious Diseases.*

(1) *Measles.*—There was an epidemic in the Pearls' Hill School which lasted nearly two months. The School was disinfected with Formaldehyde at the request of the Principal. Two cases occurred in other schools.

(2) *Chicken-pox.*—There were 12 cases in the St. Andrew's School all contracted from one boy who attended school before he was quite well. I visited the school each morning just before school commenced, for one week, and examined each boy individually excluding any with a rash. Besides these there were 8 cases distributed among other schools.

(3) *Diphtheria.*—There was one case at Geylang English School. Prophylactic injections were given to 35 boys and one teacher attending the class of the infected boy.

(4) Leprosy 2 cases.

(5) Mumps 2 cases.

(6) Small-pox 1 case.

(7) Typhoid Fever 1 case.

9. *Splenic Index of Malay Schools.*—

These Schools were specially examined for this purpose and the chart attached shows the details. I also examined the Geylang English School specially in order to submit a report to the Municipal Health Officer regarding malarial incidence in this district. There were 3 cases in the English School.

10. *Medical Certificate of Room Accommodation:*—

Such certificates (one for each class) were filled up and sent to the Principals of the Schools, with a plan of the school-classrooms, the measurement of the classes, the present number and the number to be accommodated according to Regulation 12 of the School Ordinance, 1920.

11. *Treatment.*—

I was too busy with the examination of boys to pay much time to treatment, nevertheless I was on several occasions impressed with the fact that parents are unwilling to have their children treated. It means "MONEY FROM MY POCKET" said one father; "THERE IS NO USE OF THE TEETH BEING ATTENDED TO AS I NEVER HAD MY TEETH LOOKED AT" said another; with Malays "Turun Menurun" (since our ancestors) WE NEVER HAD SUCH THINGS (operations, treatment etc.) is a common way of escape from treatment.

12. *Medical Examination of Children before Admission to Schools.*

The Anglo-Chinese School volunteered in this matter and I was asked to examine 168 intending pupils for 1927, last year. The Victoria Bridge School followed suit and I examined 42 intending pupils in this school. I cannot urge too strongly the necessity for this examination. "It saves trouble for the Headmasters and the Health Officer" said the Principal of the Anglo-Chinese School.

13. Finally I wish to thank the Heads of Schools and especially the Inspector of Schools for their kind co-operation without which the results achieved would have been impossible.

III.—INSPECTION OF PENANG SCHOOLS

(*a*) The information acquired as the result of School inspections by Officers of the Health Branch is contained in the form of the table shown below

STATISTICS OF THE EXAMINATION OF SCHOOL CHILDREN CARRIED OUT BY THE OFFICERS OF THE HEALTH BRANCH IN PENANG SETTLEMENT

Total Number of Schools inspected	Number examined	General condition not normal	Vaccination required	Deficiencies of		Malaria	Skin Diseases	Eye sight not normal	Ear diseases	Throat and nose diseases	Teeth diseased more than one	Spleen enlarged	Specific infectious or contagious diseases	Treated for intestinal worms
				Circulatory system	Respiratory system									
							Penang	*Island*						
31	3,398	86 2.5%	233 6.8%	1 .002%	30 08%	635 18.6%	536 15.6%	59 1.6%	85 2.5%	165 5%	860 25.2%	1,181 32%	88 2 5%	1,742 51.26%
						Province	*Wellesley*	*Northern*	*& Central*					
38	3,239	150 11%	150 4%	5 .01%	1 .02%	... ...	356 10%	6 .01%	... ...	280 8.6%	784 24%	416 13%	68 3%	3,239 100%
							Province	*Wellesley*	*South*					
13	916	30 3.2%	30 3.2%	4 .04%	5 .05%	... ...	14 1.5%	10 1%	2 02%	4 .04%	108 10.5%	229 25%	1 .01%	905 97.07%
							Dindings							
7	403	157 39%	79 19 5%	... ...	35 9%	... ...	163 40.4%	... ...	38 9.4%	... ...	132 33%	166 41%	35 9%	400 99%

MALACCA

Schools.—All the schools were visited; the number of pupils was 6,520. The following schools are mentioned as being in very malarious localities:—

Schools	*Number examined*	*Spleen rate*
—	—	—
Ganun	32	37·50%
Padang Sebang	74	74·32%
Pulau Sebang	100	72·00%
Cherana Puteh	35	71·43%
Sempang Ampat	74	62·16%
Pegoh	30	40·00%
Kemuning	33	93·94%
Melekek	102	36·27%
Brisu	81	40·74%
Ramuan China Besar	62	48·39%
Ramuan China Kechil	67	37·31%
Bukit Veringin	50	50·00%
Pengkalan Balak	51	58·82%
Tanjong Bidara	85	37·63%

APPENDIX "L"

SOCIAL HYGIENE BRANCH

ANNUAL REPORT BY W. M. CHAMBERS, M.D., L.R.C.P., L.R.C.S.,
Chief Medical Officer, Social Hygiene

The Social Hygiene Branch commenced work on 1st March, 1926.

All the existing V. D. Clinics were placed in charge of the Branch and a whole time staff appointed for the treatment of venereal disease. A new Clinic, specially designed for the treatment of V. D., was completed during the year at Bencoolen Street, Singapore, and was opened for treatment on 18th December, 1926.

2. *Facilities for treatment.*—

The following facilities are now available for the free treatment of all nationalities in Singapore:—

A. *Male Clinics.*—
   (i) Bencoolen Street V. D. Clinic.
   (ii) North Canal Road V. D. Clinic.
   (iii) Tanjong Pagar V. D. Clinic.
   (iv) General Hospital V. D. Clinic.
   (v) Kandang Kerbau Outdoor Dispensary.
   (vi) Joo Chiat Road Outdoor Dispensary.
   (vii) Bukit Timah Outdoor Dispensary.
   (viii) Paya Lebar Outdoor Dispensary.

B. *Female Clinics.*—
   (i) Kandang Kerbau Womens' Outdoor Dispensary.
   (ii) Bencoolen Street V. D. Clinic.
   (iii) North Canal Road V. D. Clinic.

C. *Hospitals.*—
   (i) General Hospital (male and female).
   (ii) Tan Tock Seng's Hospital (male).
   (iii) Mandalay Road Womens' Hospital.

The latter Hospital has been under construction during the year and will be ready by the middle of 1927 for the reception of female V. D. cases.

All the Clinics are open daily for the treatment of V. D. patients and at three of the male V. D. Clinics special evening sessions from 6 P.M. to 8 P.M. are provided and have attracted many patients who cannot leave their work during the day. All examinations and treatment in the female Clinics are carried out by a qualified Chinese Lady Assistant Surgeon.

Treatment of Seamen.—The Clinic at Tanjong Pagar caters for men of the Mercantile Marine and conforms to the International Agreement by treating seamen of all nationalities free of charge. The Clinic supplies sufficient therapeutic agents for treatment during the voyage to the next port of call, carries out diagnostic tests, and provides introductions to Clinics in other Ports in the East. The Personal Card (Form *V.* 44) approved by the International Agreement is used and given to each sea-faring patient. Wassermann reactions for all Clinics are carried out at King Edward VII College of Medicine.

Number of attendances.—The total out-patient attendances in the Straits Settlements numbered 54,090 compared with 20,089 in 1925, 18,994 in 1924 and 6,476 in 1923. Of the attendances 44,128 were in Singapore, to which all the following figures refer.

NEW CASES

	Syphilis	*Gonorrhœa*	*Bubo*	*Soft sore*	*Other V. D.*	*No V. D.*	*Total*
Males	3,746	1,459	823	749	158	349	7,284
Females	439	997	16	—	63	429	1,944
				Total new cases ...			9,228

	Singapore
Males	37,303
Females	6,825
Total attendances ...	44,128

Treatment by Private Practitioners.—A scheme was put into operation during the year whereby approved private practitioners were enabled to treat poor patients at reduced fees, the necessary therapeutic agents being supplied by Government free of charge.

The number of cases so treated was:—

	New cases	*Attendances*
September	121	277
October	112	362
November	112	376
December	109	390
Total ...	454	1,405

3. *Propaganda.*—Propaganda on the lines recommended by the Advisory Committee on Social Hygiene has been carried out with a view to educating the public on the subject of venereal disease.

(*a*) *Films.*—A film entitled "The Gift of Life" kindly lent by the British Social Hygiene Council was shown on 25 occasions to about 20,000 people of all nationalities. A film on the Diagnosis and Treatment of Gonorrhœa was purchased for the instruction of students and graduates of the King Edward VII College of Medicine.

(*b*) *Lectures.*—The exhibition of the film "The Gift of Life" was accompanied by lectures.

(*c*) *Pamphlets, leaflets, etc.*, have been distributed in English, Chinese, Malay and Tamil (about 44,500 copies).

(*d*) *Newspapers.*—Short articles have been contributed to and published by the local press. The Clinics have been regularly advertised in the local Chinese Press. Much valuable assistance has been rendered by the various philanthropic bodies both European and Asiatic and their co-operation has been the means of the dissemination of much useful information on venereal disease.

4. *Social Hygiene Advisory Board.*—The Board met on three occasions during the year on the following dates:—

12th April, 1926.
3rd September, 1926.
2nd December, 1926.

5. *General.*—The Social Hygiene Branch was favoured by a visit in October from Professor A. BOSTOCK HILL, a member of the Executive Committee of the British Social Hygiene Council, whose large experience and extensive knowledge of Public Health work proved of assistance in advising as to the organisation and administration of the Branch.

Close contact has been maintained with the British Social Hygiene Council who have helped by providing information on modern anti-venereal measures.

1. NEW CASES

Males

	Syphilis	*Gonorrhœa*	*Bubo*	*Soft sore*	*Other V. D.*	*No V. D.*	*Total*
Paya Lebar O. D. D. ...	94	30	13	—	1	—	138
Bukit Timah O. D. D.	116	42	18	8	4	—	188
Joo Chiat Road O. D. D.	467	148	13	—	—	—	628
North Canal Road Clinic	1,624	619	392	448	34	197	3,314
Tanjong Pagar Clinic	677	328	196	170	10	132	1,513
General Hospital ...	125	67	48	28	8	20	296
Bencoolen St. Clinic ...	3	6	1	4	2	—	16
Kandang Kerbau Outdoor Dispensary ...	640	219	142	91	99	—	1,191
	3,746	1,459	823	749	158	349	7,284

Females

	Syphilis	*Gonorrhœa*	*Bubo*	*Soft sore*	*Other V. D.*	*No V. D.*	*Total*
Kandang Kerbau Prostitutes' Clinic	46	202	1	—	—	123	372
Kandang Kerbau Womens' Outdoor Dispensary ..	307	485	—	—	63	—	855
North Canal Road Prostitutes' Clinic	86	310	15	—	—	306	717
	439	997	16	—	63	429	1,944

2. TOTAL ATTENDANCES

	Males		*Females*
Joo Chiat Road Outdoor Dispensary	1,974	Kandang Kerbau Prostitutes' Clinic	694
Bukit Timah Outdoor Dispensary	750	Kandang Kerbau Womens' Outdoor Dispensary	5,011
Paya Lebar Outdoor Dispensary	361	North Canal Road Womens' Dispensary	1,120
North Canal Road Clinic	17,745		
Tanjong Pagar Clinic	11,487		
General Hospital	1,679		
Bencoolen Street Clinic	67		
Kandang Kerbau Outdoor Dispensary	3,240		6,825
	37,303		

Total attendances, Male	37,303
,, ,, Female	6,825
	44,128

APPENDIX "M"

REPORT OF BIOLOGICAL DEPARTMENT (SESSION 1926-27)

BY PROFESSOR K. B. WILLIAMSON, *Professor of Biology, College of Medicine, Singapore*

Instruction.—Lectures have been given and practical work provided in connection with the following courses.

(1) *Elementary Biology for First Year Students.*—Weekly instruction has comprised two one-hour lectures, and two practical classes, nominally of two hours each, but usually lasting nearly three hours and sometimes more. An optional practical class was held additionally for part of the session. The class has varied in numbers from 26 to 30. The collection of the material for botanical work has fallen to me personally.

Assistants.—Mr. PATERSON of the Raffles Institution kindly acted as unpaid demonstrator from October to December. Since that date no demonstrator has been available. The practice of appointing student demonstrators has not been in force since I took over charge, having proved unsatisfactory in the past.

Equipment for Elementary Instruction.—This has, pending the arrival of items on indent, been supplemented by a few necessary local purchases mainly of glass, chemicals, and dissecting instruments sanctioned by the Principal and the present Acting Principal. The microscopes needed for work in Elementary Biology were already provided and are fully adequate for this purpose.

(2) *Protozoology and Helminthology.*—A course in these subjects including lectures and practical work, and comprising altogether eight periods of 1½ hours each was given to Fourth Year students during the current term. The short time available made it necessary to concentrate upon types of importance in connection with local diseases. It may be desirable in future years to separate the two subjects and to study them in somewhat greater detail during separate terms without, however, unduly complicating the presentation or attempting at this stage of instruction to work up to post graduate syllabuses. A number of demonstration slides as well as other specimens of worms have been prepared, and stained malarial blood films preserved as a nucleus for future instruction.

Exchanges with European and other Laboratories are under consideration in order to build up eventually a fairly complete collection of types.

Equipment.—The microscopes available in the Biological Laboratory, while adequate for elementary instruction, lack one-twelfth objectives. There is no immediate need for the latter so long as the Protozoological instruction can be given in the Bacteriological Laboratory. This was kindly agreed to by Dr. KINGSBURY this term.

Staff.—Dr. SCHARFF lectured twice and gave practical instruction during one period weekly to the First Year Students during the first term of the Session. Mr. V. NATHAN was appointed as Laboratory Assistant from 7th February and a peon was allotted ten days earlier. Mr. NATHAN is proving useful in keeping the elementary laboratory in order and in checking and recording apparatus and specimens, etc., as well as in connection with the clerical duties of the Department. He has also been entrusted with the care of the collections of insects now being formed. This work will be increasingly important.

The medical portion of the Department's work, which calls for the collection and handling of pathological material will, as the work develops, require a man of special training familiar with hospital routine. In spite of the willing assistance rendered by hospital staffs, the gathering in of fresh material for a large class cannot be assured without frequent personal visits of myself or an assistant to the various Hospitals. As material for instruction in five departments of Science, namely Botany, Zoology, Entomology, Helminthology and Protozoology fall to this department, it is necessary to look ahead to the time when advanced subjects will occupy an increasingly important place in instruction. This is especially the case since, unlike bacteria, most of the types required cannot be maintained in culture. The most pressing present need, however, is for a trained demonstrator for the elementary classes.

MISCELLANEOUS AND PERSONAL

1. *Research.*—During the transition period, prior to appointing the assistant, the need for organising instruction has precluded possibility of serious research. Some observations on the life-history of insects have, however, been made.

2. *Report.*—Worms gathered from pigs suffering from pneumonia were submitted by the Government Veterinary Surgeon on December 2nd and proved to be respectively *Metastrongylus apri* and *Trichiuris crenata.* The probability that they were the cause of the epidemic was negatively reported on and the event proved that the pigs were suffering from swine fever. The examination of tissues for *coccidiosis* gave a negative result.

3. *Publication.*—*The Future of Anti-malarial Research* (in conjunction with Ronald Senior White, Indian Medical Research Officer) in January, 1927.

In conclusion, I beg to express my thanks to Dr. MACALISTER and to Dr. KAY-MOUAT who have each, while Principal, given every possible assistance to the Department and to myself. Material for class work has very kindly been supplied by Dr. TULL, Dr. LINDOW, Dr. WEBSTER and Dr. NORRIS. The Director of the Raffles' Museum has generously presented a valuable collection of animal types including stuffed animals and vertebrate skeletons to the Department; and the Director of Botanical Gardens, Mr. HOLTUM, has likewise greatly helped laboratory work by searching out and providing fresh botanical materials. The various members of the staffs of these institutions including Messrs. CHASEN, SMEDLEY and HENDERSON have also afforded very material assistance by advice and help in identifying specimens.

APPENDIX "N"

ANNUAL REPORT

OF THE

SECTION OF BACTERIOLOGY
KING EDWARD VII COLLEGE OF MEDICINE, SINGAPORE

FOR THE YEAR 1926

BY A. N. KINGSBURY, M.B., B.S., *Professor of Bacteriology*

The separate section of Bacteriology was opened on April 31st, when the Professor assumed duty. By foresight of the Principal, all essential apparatus had been indented for some months earlier and much of it had been delivered. After a short interval for the assembly and fitting up of laboratory equipment, acid-proofing of benches, etc., it was decided that the section should be responsible for the routine bacteriological work from the Government Hospitals, Dispensaries and Health Branch. Serological tests for syphilis on specimens for the Venereal Diseases Clinics were also to be carried out, but such specimens from Government Hospitals were to continue to be within the province of the Government Pathologist. This arrangement became operative on June 7th and the sub-joined report thus covers little more than second half of the year.

SEROLOGY

Specimens submitted for the diagnosis of syphilis from the Venereal Diseases Clinics number only about eighty per week. But a number of patients are non-resident and attend the clinics only while passing through the port. It is therefore advisable that the interval between the taking of a specimen and the receipt of the report should be as short as possible. For this reason daily tests were instituted.

In view of the untrained and meagre staff available and of the very considerable volume of other specimens passing through the laboratory, daily Wassermann reactions were out of the question. The Kahn test was adopted because many reputable workers have recorded excellent results with the reaction—it has now superseded the Wassermann reaction in the United States Navy—and further, the Medical Research Council and the Health Organisation of the League of Nations have issued very satisfactory reports on the accuracy of precipitation tests for diagnosis of syphilis.

The antigen has been prepared from local bullock hearts, batches of at least ten having been used, to minimise the error introduced by an occasional heart of abnormal consistency: absolute alcohol for extraction, distillation and redistillation over quick lime under reduced pressure has been employed. The test has been found economical both as regards *material* and time and the results which are embodied in the following Table (*I*) are regarded as satisfactory.

TABLE *I*

RESULTS OF THE KAHN TEST ON SPECIMENS FROM THE VENEREAL DISEASES CLINICS

Nationality	Positive	Partial Positive	Negative	Totals
Malays	24	1	57	82
Chinese	686	36	838	1,560
Indians	67	1	117	185
Others	30	4	127	161

At the suggestion of Dr. W. M. Chambers, Chief Medical Officer, Social Hygiene, it was decided to carry out serological tests on about 1,000 prison inmates in order to arrive at figures indicative of the incidence of syphilis in Singapore. The results of the investigation are included in Table *II*.

TABLE *II*

Results of the Kahn Test on Prisoners

Nationality	Positive	Partial Positive	Negative	Totals
Malays	31	0	41	72
Chinese	239	2	574	815
Indians	20	0	92	112

About 40 per cent of specimens from Clinics and 29 per cent from the gaol were found to be positive though a proportion of these positive results was doubtless due to yaws. The majority of prison inmates were however from Singapore town where yaws is not prevalent. A higher incidence of syphilis is to be expected among the criminal classes than among the general population, but the results of the investigation indicate that the incidence among the Asiatic population of Singapore is deplorably high.

Agglutination Tests

All specimens submitted for the Widal reaction have been tested with formalinised emulsions of *B. typhosus, B. paratyphosus A., B. and C., B. proteus—X 19* (W. and K. Strains) *and B. Whitmori* Typhoid cases were found to out-number the paratyphoids by about eight to one and no *B. paratyphosus C.* infections were diagnosed. There was a marked rise in the monthly number of widals positive for typhoid from cases admitted to hospital during the months of August and September.

A serum of one case, a European, agglutinated *B. proteus X 19* (Warsar) in high dilutions and clinically a diagnosis of Typhus was compatible with the symptoms. The rash was well marked and the course of the disease agreed with the description of Tropical Typhus given by Dr. W. Fletcher in Bulletin No. 1, 1926 from the Institute for Medical Research, Federated Malay States. Convalesence was very protracted. No facts of etiological significance could be elicited, although lice were almost certainly eliminated as the vector.

The results of the agglutination tests are given below.

TABLE *III*

Diagnosis of Agglutination Tests

Total	—	Positive for—						Negative
	B. typhosus	B. Paratyphosus			B. Proteus X19		B. whitmore	
		A	B	C	Warsar	Kingsbury		
362	108	4	10	0	1	0	0	239

A few agglutinations were also carried out for the diagnosis of the more chronic *B. Dysenteriæ* (Flexner) and (Shiga) infections, when difficulty was experienced in isolating the causative organism from the fæces.

BLOOD CULTURES

Blood cultures were made from 13 cases, with the following positive results—*B. typhosus* (1) *B. fæcalis alkaligenes* (1) *B. pyocyaneus* (1) *S. aureus* (2) and *S. albus* (1).

BACTERIOLOGICAL EXAMINATION OF URINES

Specimens of urine were submitted from 158 cases. From two of them *B. typhosus* was isolated and from 73, coliform bacilli. In a number of catheter specimens, coliform bacilli were found with an absence of pus cells, and blood cultures were prepared from four of these cases to ensure that the condition was not primarily a septicæmia. The blood cultures were however negative.

BACTERIOLOGICAL EXAMINATION OF FÆCAL SPECIMENS

Examinations were carried out on 232 specimens. Pathogenic protozoa were rarely found because a primary film examination is made in the hospitals and such infections are accordingly treated without the reference of specimens to these laboratories. *E. histolytica* was, however, identified in two specimens and *Balantidium coli* in one. For cultural examination eosin-methylene blue medium has been employed with very satisfactory results. *B. dysenteriæ* (Flexner) was isolated from 64 cases, *B. dysenteriæ* (Shiga) from 11, *B. dysenteriæ* (Strong) from 2, *B. typhosus* from 11, and *B. paratyphosus A.* from 1.

CONJUNCTIVAL SMEARS

In comparison with India, conjunctivitis is not a common local complaint on account of the comparative absence of dust. Twenty-five films were examined of which one contained *gonococci*, four the *Koch Weeks bacillus*, and five the *Morax Axenfeld bacillus*.

SPECIMENS OF CEREBRO-SPINAL FLUID

From 11 specimens submitted, the *pneumococcus* was isolated from one, the *meningococcus* from two, and bacilli of the *Friedlander* group from three cases.

DIPHTHERIA

A total of 27 throat swabs were examined and the *Klebs Loeffler bacillus* was found in seven instances.

TOTAL SPECIMENS

The total specimens examined numbered 4,021.

RESEARCH WORK

Research has been greatly handicapped by lack of adequate staff. The Section was started with a part time (about 2½ hours daily) assistant surgeon and a necessarily untrained laboratory assistant and peon. For smooth and efficient running and to allow of research, at least one full time assistant surgeon, two laboratory assistants and two peons are necessary.

Early in the year, the Professor was nominated to correlate an enquiry into the incidence of cancer in British Malaya which was undertaken at the request of the Ministry of Health. Although a large volume of correspondence has been entailed, no allotment of definite clerical assistance was made and the work has made heavy inroads into the time available. Some experiments on quinine metabolism have been undertaken with a view to determining if the product resulting from the action of liver emulsion on quinine is plasmodiocidal and if such product could be employed for intramuscular injection without the resulting necrosis which is frequently occasioned by quinine. The investigation is incomplete at the present time.

PUBLICATIONS

1. "On the Carbon Tetrachloride Treatment of Ankylostomiasis with "a Note on the Hook-worms of Penang."

   (from the Institute for Medical Research, F. M. S.).

   Trans. Roy. Soc. Trop. Med. and Hyg. XIX 397

2. "Some Investigations of Malarial Fevers."
   (From Institute for Medical Research. F. M. S.).
   1. "Serum Bilirubin in Malarial Infections."
   2. "The Effect of Quinine Exhibition on Serum Bilirubin."
   3. "The Examination of Urine, with special reference to the Excretion of Urobilin and Urobilinogen."

      Trans. Roy. Soc. Trop. Med. and Hyg. XIX 459.
   4. "On Occupational Cancer, with special reference to Industries of "Malaya."."

      Malayan Medical Journal. I. Oct.

TABLE I

STAFF

1. The sanctioned European staff in the Straits Settlements numbers 126 distributed as follows:—

GENERAL

Principal Civil Medical Officer, Straits Settlements.

One Financial Officer, Medical Department.

HOSPITALS AND DISPENSARIES

Chief Medical Officer, Singapore.

One Financial Officer, Hospitals, Singapore.

Chief Medical Officer, Penang.

Chief Medical Officer, Malacca.

Senior Surgeon, Singapore.

Senior Surgeon, Penang.

Thirteen Medical Officers, Singapore. (Two ladies).

Six Medical Officers, Penang. (One lady).

One Medical Officer, Malacca.

One Medical Officer, Labuan.

One Superscale Matron, General Hospital. Singapore.

One Matron, Class I, Penang.
Six Matrons, Class II.
Twenty-eight Sisters, Singapore.
Eleven Sisters, Penang.
One Sister, Malacca.
Two European Attendants.
One Lay Superintendent, Leper Settlement Pulau Jerejak.

HEALTH BRANCH

Chief Health Officer, Singapore.
Senior Health Officer, Penang.
Six Health Officers, Singapore. (One lady).
One Health Officer, Malacca.
Three Sanitary Inspectors (two chiefs).
Lay Superintendent, Quarantine Station, Singapore.
Three Public Health Sisters.
Lay Superintendent, Quarantine Station, Penang.
Lay Superintendent, Leper Settlement, Pulau Jerejak.
One Sister, Quarantine Station, Singapore.

PATHOLOGICAL BRANCH

One Pathologist, Singapore.
One Pathologist, Penang.
One Bacteriologist, Singapore.

COLLEGE OF MEDICINE, SINGAPORE

Principal.
Professor of Physiology.
Professor of Anatomy.
Professor of Medicine.
Professor of Surgery.
Professor of Clinical Surgery.
Professor of Midwifery and Gynæcology.
Professor of Bacteriology.
Professor of Biology.
Professor of Bio-Chemistry.
Professor of Dental Surgery.
Dental Mechanic.
Janitor.

LUNATIC ASYLUM, SINGAPORE

Medical Superintendent.
One Matron, Class II.
Three European Attendants.

SOCIAL HYGIENE BRANCH, SINGAPORE

Chief Medical Officer.
One Medical Officer.

ANALYST'S BRANCH

Analyst, Singapore.
Deputy Analyst, Penang.
Three Analysts, Singapore.

2. In addition fourteen time scale Medical or Health Officers and seven Nursing Sisters are borne on the establishment for service in the Unfederated Malay States, and one time scale Medical Officer for service at the Indian Immigration Depôt, Avadi, Madras, making a total of 148.

The post of Principal Medical Officer, Johore, is also held by a member of the Straits Medical Department.

3. Local qualified medical staff (Specialists, Deputy Medical Officers, Deputy Health Officers, Assistant Medical Officers, Assistant Health Officers and Assistant Surgeons) numbered 56.

TABLE II

Financial

1926

Revenue

	$ c.	$ c.
Singapore.—		
Hospitals Board	279,011 82	
Medical General	4,520 00	
Health	85,398 45	
Analyst	14,541 00	
		383,471 27
Penang.—		
Hospitals Board	81,889 61	
Payment for lepers	81,373 51	
Medical General Health Analyst	113,561 11	
		276,824 23
Malacca.—		
Hospitals Board	19,295 83	
Medical General Health	2,524 50	
		21,820 33
Labuan	2,342 84	
		2,342 84
Total		$684,458 67

1. The revenue collected in the Medical Department is classified under three headings, *viz:*—

(*a*) Hospitals Board (Hospitals and Dispensaries).

(*b*) Medical General which includes Medical, Pathological Branch, College of Medicine, Singapore, Lunatic Asylum and Government Analyst's Branch.

(*c*) Health Branch.

The income from "Hospitals and Dispensaries" and Lunatic Asylum, Singapore, is paid into the account of the Hospitals Board, which is administered by a Special Committee. In addition to the amounts paid into the

Hospitals Board Account as shown above the Board received contributions from Government for the various Settlements as follows:—

	$
Singapore	782,020
Penang	445,714
Malacca	85,380
Labuan	3,460
Total ...	$1,316,574

3. No income is derived from the Pathological Branch.

4. Fees collected under Medical General and Health Branch are paid into the Treasury as General Government Revenue.

5. Fees collected under College of Medicine, Singapore, are paid into the College Fund.

1926

EXPENDITURE

Singapore.—

	$	c.	$	c.
Hospitals Board			597,888	11
Medical General:—				
Medical Personal Emoluments ...	169,564	62		
Pathological Branch, Personal Emoluments	13,035	21		
Pathological Branch, Other Charges ...	5,217	84		
College of Medicine, Personal Emoluments	95,225	39		
College of Medicine, Other Charges ...	27,222	74		
Lunatic Asylum, Personal Emoluments ...	44,031	82		
Analyst's Branch, Personal Emoluments ...	38,402	45		
Analyst's Branch, Other Charges ...	3,929	55		
Health Branch, Personal Emoluments ...	187,823	28		
Health Branch, Other Charges ...	209,983	00		
Hospitals and Dispensaries	748,508	12	1,542,944	03
Total ...			2,140,832	14

Penang.—

	$	c.	$	c.
Hospitals Board			397,675	69
Medical General including Pathological Branch, Personal Emoluments ...	40,777	16		
Medical including Pathological Branch, Other Charges	8,624	83		
Analyst's Branch, Personal Emoluments ...	11,020	00		
Health Branch, Personal Emoluments ...	50,496	16		
Health Branch, Other Charges ...	104,077	08		
Hospitals and Dispensaries, Personal Emoluments	267,400	15		
Federated Malay States Agency ...	1,771	85	484,167	23
Total ...			881,482	92

Malacca.—

		$ c.
Hospitals Board		104,029 50
Medical, Personal Emoluments ...	19,442 67	
Medical, Other Charges	3,706 33	
Pathological Branch, Personal Emoluments	7,912 11	
Pathological Branch, Other Charges ...	2,474 39	
Health Branch, Personal Emoluments ...	18,229 27	
Health Branch, Other Charges ...	45,696 79	
Hospitals and Dispensaries	81,605 22	
		179,066 78
Total ...		283,096 28

Labuan	18,845 53

SUMMARY

	$ c.
Singapore	2,140,832 14
Penang	881,842 92
Malacca	283,096 28
Labuan	18,845 53
Grand Total ...	3,324,616 87

The Other Charges of the Hospitals and Dispensaries are shown under the head Hospitals Board Expenditure.

1. The total expenditure of the Medical Department for the Straits Settlements for the year 1926 amounted to $3,324,616.87.

2. Under College of Medicine the expenditure for Personal Emoluments is shown as $95,225.39, and Other Charges as $27,222.74. Half of these amounts were refunded by the Federated Malay States Government.

TABLE III *A*

Estimated Population, with Birth and Death-rates for the years 1925 and 1926

Settlement or Province	Population		Births		Deaths		Birth-ratio per mille		Death-ratio per mille	
	Estimated, 1925	Estimated, 1926	1925	1926	1925	1926	1925	1926	1925	1926
Singapore	511,441	491,583	15,044	15,798	13,575	16,045	30.89	30.89	27.61	31.37
Labuan	5,641	5,694	233	303	207	210	40.92	53.71	36.35	37.21
Penang	176,126	173,217	5,783	5,923	5,201	6,046	33.39	33.63	30.03	34.33
Province Wellesley	131,930	131,577	4,374	4,557	3,735	4,250	33.24	34.54	28.38	32.21
Dindings	16,260	15,185	433	473	343	476	28.51	29.09	22.52	29.27
Malacca	184,437	177,010	5,798	6,640	4,046	5,606	32.76	36.00	22.85	30.40
Total ...	1,025,835	994,266	31,665	33,694	27,106	32,633	31.98	32.85	27.26	31.81

TABLE III *B*

Quarterly Death-rates for various parts of the Colony during the past 3 years were:—

Year	1924				1925				1926			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Singapore ...	24.62	27.14	29.06	25.64	22.91	28.32	28.26	30.85	26.42	36.01	32.60	30.41
Penang Island ...	28.35	31.55	32.29	30.08	28.80	30.91	29.97	31.51	33.93	41.42	32.81	29.23
Province Wellesley ..	27.40	28.82	30.09	30.58	25.31	27.93	29.20	31.15	27.88	36.51	32.09	32.33
Dindings ...	20.86	23.27	22.64	19.24	18.14	26.23	26.23	22.73	26.39	28.13	30.76	31.49
Malacca	26.11	26.76	27.01	24.53	22.25	22.07	21.76	23.44	29.17	33.18	29.69	29.54

TABLE III *C*

POPULATION ESTIMATED RACIALLY AND COLLECTIVELY OF THE STRAITS SETTLEMENTS FOR THE YEARS 1926, 1925 AND 1924

Settlements or Province	Europeans	Eurasians	Chinese	Malays	Indians	Other Nationalities and Unknown	Total 1926	Total 1925	Total 1924
Singapore	8,023	6,055	388,664	63,246	37,702	7,751	511,441	491,583	469,071
Penang	1,232	1,562	111,988	36,705	22,844	1,795	176,126	173,217	170,383
Province Wellesley	413	357	35,336	66,183	29,177	464	131,930	131,577	131,241
Dindings	25	28	3,713	5.415	7,060	19	16,260	15,185	14,217
Malacca	563	1,874	52,908	90.723	38 151	218	184 437	177,010	170,294
Labuan	22	13	1.533	3,937	92	44	5,641	5,694	5,746
Total ...	10,278	9,889	594,142	266,209	135,026	10,291	1,025,835	994,266	960,952

TABLE III *D*

BIRTHS REGISTERED IN THE STRAITS SETTLEMENTS DURING 1926 AND THEIR RATIO PER MILLE OF POPULATION

Settlement or Province.	Male	Female	Total. 1926	Total, 1925	Total, 1924	Ratio per mille 1926	Ratio per mille 1925	Ratio per mille 1924
Singapore	8,380	7,418	15,798	15,044	14,398	30.89	30.87	30.69
Penang	3,023	2,900	5,923	5,783	5,752	33.63	33.39	33.77
Province Wellesley	2,290	2,267	4,557	4,374	4,415	34.54	33.24	31.33
Dindings	222	251	473	433	404	29.09	28.51	28.42
Malacca	3,403	3,237	6,640	5,798	5,834	36.00	32.76	34.26
Labuan	164	139	393	233	225	53.71	40.92	39.15
Total ...	17,482	16,212	33,694	31,665	31.028	32.85	31.98	32.29

TABLE III *E*

BIRTHS REGISTERED IN THE STRAITS SETTLEMENTS DURING 1926 ACCORDING TO NATIONALITIES

Settlement or Province	Europeans		Eurasians		Chinese		Malays		Indians		Japanese		Other Nationalities		Total	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
Singapore	138	17.20	160	26.42	12,026	30.94	2,524	39.91	706 S. 124 N.	22.01	64	21.32	56	7.22	15,798	30.89
Penang	56	45.45	51	32.65	3,812	34.04	1,375	37.46	562 S. 28 N.	25.83	5	29.23	34	18.94	5,923	33.63
Province Wellesley ...	1	2.42	8	22.41	1,329	37.61	2,529	38.21	668 S. 2 N.	22.96	...	...	20	43.10	4,557	34.54
Dindings	...	...	...	...	121	23.59	242	44.69	109 S. 1 N.	15.44	...	...	...	...	473	29.09
Malacca	11	19 54	76	40.55	1,818	34.36	4,212	46.43	508 S. 11 N.	13.60	...	...	4	18.35	6,640	36.00
Labuan	...	...	8	615.38	202	51.30	82	53.48	1 S. 2 N.	32.60	...	...	8	190.47	303	53.71
Total ...	206	20.04	303	30.64	19,308	32 50	10,964	41.19	2,722 S.	20.15	69	21.75	122	11.86	33,694	32.85

S.—denotes Southern. N.—denotes Northen.

TABLE III *F*

DEATH REGISTERED IN THE STRAITS SETTLEMENTS IN 1926 ACCORDING TO NATIONALITIES

Settlements	Europeans		Eurasians		Chinese		Malays		Indians		Other Nationalities and Unknown		Total	
	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille
Singapore	72	8.97	121	19.98	12,671	32.60	2,047	32.37	1,039	27.56	95	12.26	16,045	31.37
Penang	18	14.60	39	24.97	3,632	32.43	1,324	36.07	993	43.47	40	22.28	6,046	34.33
Province Wellesley	2	4.84	5	14.01	1,321	37.38	1,856	28.04	1,038	35.58	28	60.34	4,250	32.21
Dindings	...	...	...	...	160	43.09	155	28.77	154	21.81	7	368.42	476	29.27
Malacca	3	5.33	51	27.21	1,957	36.99	2,875	31.69	715	18.74	5	21.94	5,606	30.40
Labuan	...	...	2	153.84	139	35.30	57	37.83	2	21.73	10	229.09	210	37.21
Total ...	95	9.24	218	22.45	19,880	33.46	8,314	31.25	3,941	29.11	185	17.98	32,633	31.81

TABLE III *G*

Deaths registered in the Straits Settlements in 1926 under different group of Ages

Ages	Singapore	Penang	Province Wellesley	Dindings	Malacca	Labuan	Total
Under 3 months	1,847	598	422	65	1,181	43	4,156
3 months and under 1 year	1,754	458	202	32	600	35	3,081
1 year to 5 years	1,460	779	790	86	487	28	3,540
5 years to 10 years	406	182	195	22	227	4	1,036
10 years to 20 years	668	296	223	22	249	4	1,462
20 years to 25 years	993	305	218	26	240	5	1.787
25 years to 35 years	2,513	861	540	65	750	18	4,747
35 years to 45 years	2,409	752	475	57	629	22	4 344
45 years to 55 years	1,852	655	382	32	482	24	3,427
55 years to 75 years	1,745	885	647	56	586	27	3,946
75 years and above	369	181	243	12	171	...	976
Unknown	29	94	3	1	4	...	131
Total ...	16,045	6,046	4,250	476	5,606	210	32,633

TABLE III *H*

Table showing the Infantile Mortality (under one year) in the Straits Settlements including children born elsewhere

Settlements	Births	Deaths	Ratio per mille of Births		
			1926	1925	1924
Singapore	15,798	3,601	227.94	209.98	219.75
Penang	5,923	1,056	178.29	159.43	167.24
Province Wellesley	4,557	624	136.93	140.60	144.51
Dindings	473	97	205.07	157.04	143.56
Malacca	6,640	1,781	268.22	226.46	253.34
Labuan	303	78	257.42	283.26	235.56
Total ...	33,694	7.237	214.79	194.00	204.76

TABLE III *I*

Table showing the Infantile Mortality (children under one year) in the Straits Settlements and Nationalities, excluding children born elsewhere

Nationalities	Singapore			Penang			Province Wellesley			Dindings			Malacca			Labuan			Total		
	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio
Europeans	6	...	57 97	1	...	17.86	...	...	...	...	...	...	...	...	...	...	...	...	7	...	33.98
Eurasians	39	1	243.75	3	...	58 82	2	...	250.00	...	...	...	15	...	197.37	1	...	125.00	60	1	198 02
Chinese	2,306	147	191 75	642	33	168.42	168	3	126 41	23	...	190.08	437	4	240.37	20	...	99.01	3,596	187	186.24
Malays	802	61	317.75	253	6	184.00	281	1	111.11	37	1	152.89	1,176	6	280.63	56	1	682.93	2,605	76	237.06
Northern Indians	27	1	218.55	1	2	159.32	...	1	220 89	...	...	...	1	...	90.91	...	...	...	29	4	172.02
Southern Indians	173	5	245 04	93	20		148	8		27	2	245.45	133	9	279.02	...	...	...	574	44	224.75
Japanese	6	1	93.75	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	6	1	86.96
Other Nationalities and Unknown ...	26	...	346.67	2	...	58.71	12	...	600.00	7	...	...	...	...	..	...	...	...	47	...	385.25
Total ...	3,385	216	214.27	995	61	167.99	611	13	134.08	94	3	198.73	1,762	19	265.36	77	1	254.13	6,924	313	205.47

TABLE III *J*

Deaths registered in the Straits Settlements as regards Certificates in the year 1926

Particulars	Singapore	Penang	Province Wellesley	Dindings	Malacca	Labuan	Total
Died in Hospitals	4,094	1,234	430	65	759	15	6 597
Certified by Medical Practitioners	3,820	719	3	...	187	20	4,749
Certified by Registering Officers after death	5,028	2,607	...	...	741	88	8,454
Uncertified	3,103	1,486	3,817	411	3,919	87	12,823
Total ...	16.045	6.046	4.250	476	5,606	210	32,633

TABLE *IV*

Meteorological Returns for the Straits Settlements for the year 1926 and also two graphs supplied by Dr. GILBERT E. BROOKE, showing, the wettest and driest years since 1869, and the annual rainfall in inches and millemetres since 1862.

METEOROLOGICAL RETURN FOR THE YEAR 1926

Singapore

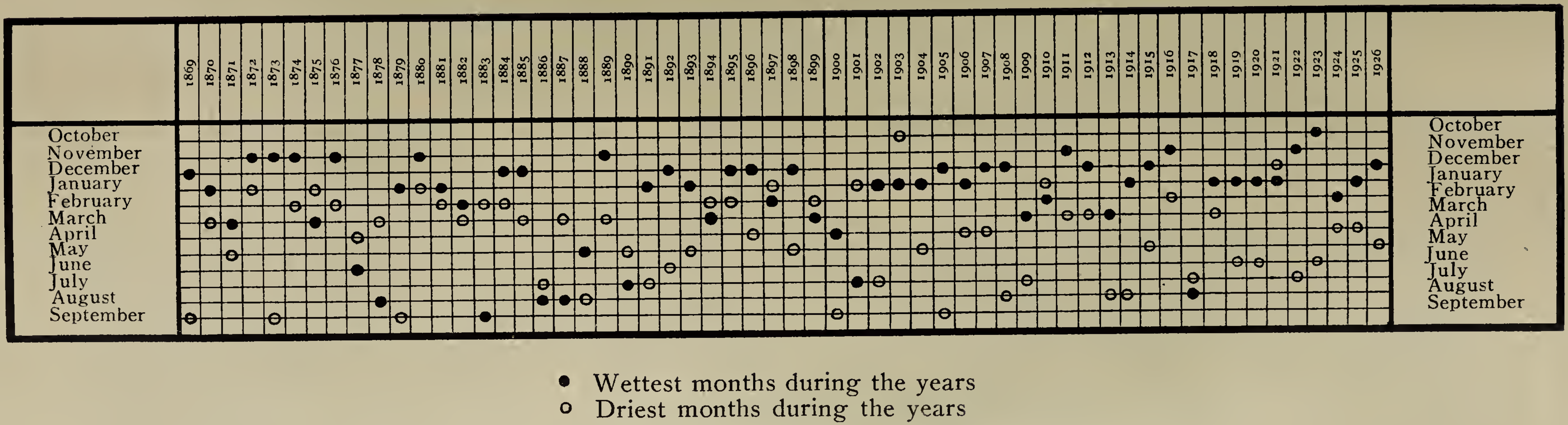
—	TEMPERATURE						RAINFALL		WINDS	REMARKS
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in m. m	Degree of Humidity	General Direction	
January ...	134	70.4	84.9	72.7	12.2	77.6	139.10	80	N.E.	
February ...	150.1	70.8	88.3	73.3	15.0	79.4	179.49	75	N.E.	
March ...	151.7	70.6	88.8	74.4	14.4	80.2	104.14	76	N.E.	
April ..	150.4	71.2	90.4	76.0	14.4	81.8	180.11	78	S.E.	
May ...	148.5	70.8	89.4	76.3	13.1	81.9	65.24	79	S.E.	
June ...	143.6	70.5	88.1	76.3	11.8	81.2	136.74	80	S.E.	
July ...	142.0	72.0	87.9	75.3	12.6	80.4	220.38	80	S.E.	
August ...	145.6	72.2	88.8	75.5	13.3	80.6	148.84	80	S.E.	
September ...	143.0	71.5	87.2	74.9	12.3	79.9	277.34	82	S.E.	
October ...	145.0	71.9	86.8	74.9	11.9	79.8	192.49	83	S.W.	
November ...	141.0	70.7	86.8	74.1	12.7	79.3	211.66	82	N.W.	
December ...	145.0	70.9	86.1	73.9	12.2	78.7	316.80	86	N.E.	
Mean ...	145.2	71.1	87.8	74.8	13.0	79.9	2,172.38	80		

METEOROLOGICAL RETURN FOR THE YEAR 1926

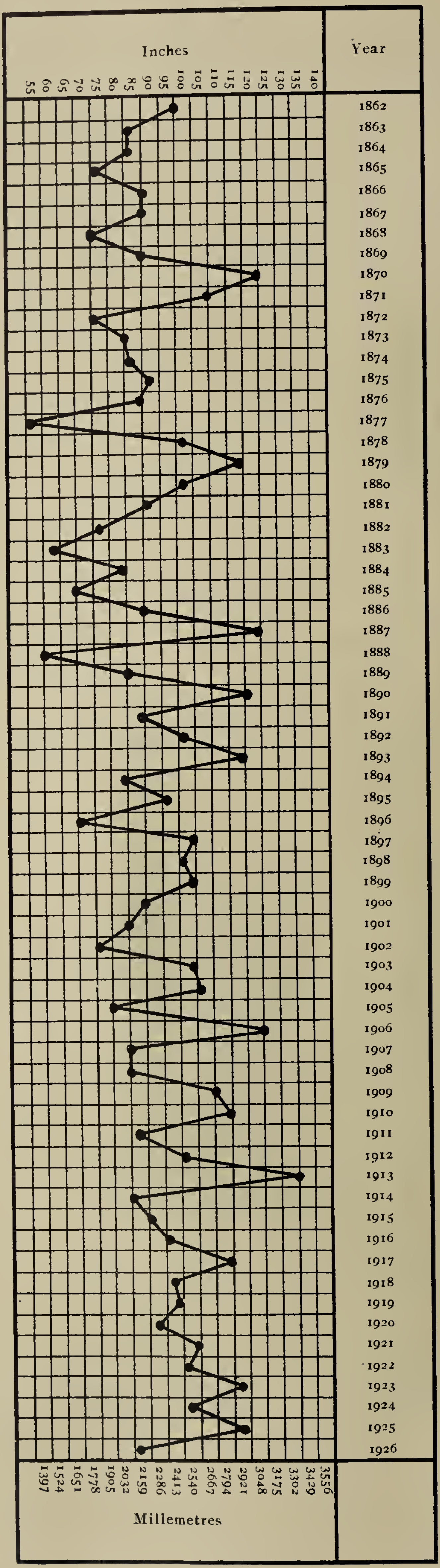
Penang

—	TEMPERATURE						RAINFALL		WINDS	REMARKS
	Solar Maximum	Mimimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	
January	160	65	94	69	25	81.8	39	67	N.W.	
February	160	68	96.5	69	27.5	83.4	11	66	N.W.	
March	162	69	98	70.5	27.5	84.5	83	66	S.	
April	163.5	72	98	72	26	84.4	267	73	N.W.	
May	161	72	95	70.5	24.5	81.9	139	76	S.	
June	161.5	70	93	70	23	82.2	164	77	S.	
July	161	69	93	69	24	81.7	197	77	S.	
August	161	69	96	70	26	81.1	212	73	S.	
September .	161	68	95	70	25	83	217	76	S.	
October	157	69	92	69.5	22.5	82.6	750	78	N.W.	
November ...	157	69	93	70	23	80.6	254	76	N.E.	
December ...	158	65	94	69	25	80	634	76	N.W.	
Mean ...	163.5	65	98	69	...	82.2	Total 2,967	73		

Showing the Wettest and Driest Months During the same Years



ANNUAL RAINFALL



SHOWING THE ANNUAL RAINFALL IN INCHES AND MILLEMETRES SINCE 1862

METEOROLOGICAL RETURN FOR THE YEAR 1926

Malacca

—	Temperature					Rainfall		Winds	Remarks
	Solar Maximum	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	
January	108	88	73	15	82	79.4	82	Anemometer Under Repair	
February	126	91	73	18	84	60.6	75		
March	128	92	74	18	85	152.8	80		
April	126	91	75	16	84	220.0	85		
May	122	91	75	16	84	180.3	86		
June	121	89	75	14	83	287.8	87		
July	119	89	75	14	83	118.4	87		
August	119	88	75	13	83	294.4	86		
September ...	115	88	74	14	82	320.8	88		
October	122	89	74	15	83	119.0	87		
November ...	115	88	74	14	82	254.2	88		
December	114	87	74	13	81	321.4	88		
Mean ...	119	88	74	...	83	2,409.1	85		

METEOROLOGICAL RETURN FOR THE YEAR 1926

Labuan

—	Temperature					Rainfall		Winds		Remarks
	Solar Maximum	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	Average Force	
January ...	131	82.9	75.5	7.4	79.2	152.5	87	N. E. S.	2	
February ...	143	86.1	77.1	9.0	82.6	Nil.	85	N. E.	2	
March ...	136	88.1	77.1	11.0	82.6	1.0	82	N.E. & N.W.	2	
April	140	88.9	78.1	10.2	83.8	136.5	80	C.N.W., S.W.	1	
May	132	89.3	78.6	10.7	83.9	448.5	81	C.N.E., S.N.W.	1	
June	127	88.8	75.8	13.0	82.3	250.5	83	,,	1	
July	126	87.5	76.9	10.6	82.2	235.5	84	C. M. O.	1	
August ...	133	88.8	78.1	10.7	83.4	82.0	83	,,	1	
September ...	130	84.3	73.7	10.6	78.0	355.5	81	N.E., N.W.	1	
October ...	131	87.9	77.1	10.8	82.5	736.5	83	S.E., S.W.	1	
November ..	132	87.7	77.3	10.4	82.5	282.0	82	,,	1	
December ..	131	87.9	77.2	10.7	82.5	501.5	82	,,		
Mean ...	132	87.3	76.9	10.4	83.9	3,152.0	...	...	1.25	

TABLE V

HOSPITALS OF THE STRAITS SETTLEMENTS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926

DISEASES	*Remaining in Hospital at the end of 1925	YEARLY TOTAL		†Total Cases Treated	‡Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
I.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES						
1. Enteric Group—						
(*a*) Typhoid Fever ...	8	195	78	203	16	
(*b*) Paratyphoid A. ...	...	9	1	9	...	
(*c*) Paratyphoid B. ...	1	7	...	8	...	
(*d*) Type not defined	...	...	...	...	...	
2. Typhus	...	1	...	1	1	
3. Relapsing Fever ...	...	...	...	...	...	
4. Undulant Fever ...	...	...	...	...	...	
5. Malaria—						
(*a*) Tertian ...	45	2,437	54	2,482	66	
(*b*) Quartan ...	7	247	10	254	11	
(*c*) Aestivo-autumnal	123	7,719	769	7,842	153	
(*d*) Cachexia ...	40	1,106	63	1,146	39	
(*e*) Blackwater ...	...	3	1	3	...	
(*f*) Unclassified ...	26	2,302	73	2,328	61	
(*g*) Mixed infection ...	...	475	42	475	7	
6. Small-pox	9	77	5	86	2	
7. Measles	1	217	1	218	5	
8. Scarlet Fever ...	...	1	...	1	...	
9. Whooping Cough ...	...	8	2	8	...	
10. Diphtheria ...	1	14	3	15	...	
11. Influenza	11	1,029	43	1 040	20	
12. Miliary Fever ...	...	...	...	...	...	
13. Mumps	...	54	...	54	2	
14. Cholera	2	194 (*a*)	102	196	1	(*a*) Including imported cases
15. Epidemic diarrhœa ...	...	55	...	55	...	
16. Dysentery—						
(*a*) Amœbic ...	22	886	255	908	45	
(*b*) Bacillary ...	11	756	248	767	45	
(*c*) Undefined or due to other causes	7	221	41	228	9	
Carried forward ...	314	18,013	1,791	18,327	483	

The form shows in the main the arrangement of diseases in the *International Nomenclature, 1921 Edition*. To save space the unimportant diseases of any class are grouped in their places as "Other Diseases" of the Class. It will not be possible to use the Manual of the International List of causes of Death published in 1926 until 1928, as copies of it have not been received at the date of printing report.

* *i.e.* the year previous to that for which the return is made

† "Total cases treated" include those remaining in Hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year's Return.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1925	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	314	18,013	1,791	18,327	483	
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.—(*Continued*)						
17. Plague—						
(*a*) Bubonic ...	...	3	2	3	...	
(*b*) Pneumonic ...	...	...	...	...	...	
(*c*) Septicæmic ...	...	...	...	...	...	
19. Spirochætosis icterohæmorrhagica ...	...	...	...	...	...	
(*d*) Undefined ...						
18. Yellow Fever ...	...	...	...	...	...	
20. Leprosy	828	326	140	1,154	838	
21. Erysipelas	...	17	1	17	2	
22. Acute Poliomyelitis ...	...	...	...	...	...	
23. Encephalitis Lethargica	...	1	...	1	...	
24. Epidemic Cerebro-spinal Fever ...	...	13	3	13	...	
25. Other Epidemic Diseases—						
(*a*) Rubeola (German Measles) ...	...	...	...	...	...	
(*b*) Varicella (Chicken pox) ...	2	119	...	121	3	
(*c*) Kala-azar ...	...	...	...	...	...	
(*d*) Phlebotomus Fever ...	...	...	...	...	...	
(*e*) Dengue ...	1	80	...	81	...	
(*f*) Epidemic Dropsy	...	...	...	...	...	
(*g*) Yaws ...	1	47	...	48	1	
(*h*) Trypanosomiasis	...	...	...	...	...	
26. Glanders	...	...	...	...	...	
27. Anthrax ...	...	...	...	...	...	
28. Rabies	...	1	1	1	...	
29. Tetanus	1	44	34	45	3	
30. Mycosis	...	1	...	1	...	
31. Tuberculosis, Pulmonary and Laryngeal ...	120	1,673	779	1,793	134	
32. Tuberculosis of the Meninges or Central Nervous System ...	...	29	17	29	...	
33. Tuberculosis of the Intestines or Peritoneum	...	50	44	50	1	
34. Tuberculosis of the Vertebral Column ...	...	7	...	7	3	
Carried forward ...	1,267	20,424	2,812	21,691	1,468	

Return of Diseases and Deaths (In-patients) for the year 1926—*Contd.*

Diseases	Remaining in Hospital at the end of 1925	Yearly Total		Total cases Treated	Remaining in Hospital at the end of 1926	Remarks
		Admissions	Deaths			
Brought forward ...	1,267	20,424	2,812	21,691	1,468	
I.—Epidemic, Endemic, and Infectious Diseases.—(*Continued*)						
35. Tuberculosis of Bones and Joints ...	11	36	4	47	15	
36. Tuberculosis of Other Organs—						
(*a*) Skin or Subcutaneous Tissue (Lupus)	...	1	...	1	...	
(*b*) Bones ...	...	...	...	...	...	
(*c*) Lymphatic System	1	18	...	19	1	
(*d*) Genito-urinary ...	...	2	1	2	1	
(*e*) Other organs ...	1	26	2	27	2	
37. Tuberculosis disseminated—						
(*a*) Acute ...	...	...	...	...	...	
(*b*) Chronic ...	...	...	...	...	...	
38. Syphilis—						
(*a*) Primary ...	48	824	5	872	47	
(*b*) Secondary ...	81	1,773	19	1,854	151	
(*c*) Tertiary ...	57	671	73	728	59	
(*d*) Hereditary ...	1	18	8	19	...	
(*e*) Period not indicated	5	49	...	54	1	
39. Soft Chancre ...	42	664	...	706	36	
40. A.—Gonorrhœa and its complications ...	39	733	...	772	42	
B.—Gonorrhœal Ophthalmia ...	2	222	...	224	17	
C.—Gonorrhœl Arthritis	8	158	...	166	14	
D.—Granuloma Venereum	1	10	...	11	...	
41. Septicæmia ...	1	80	68	81	2	
42. Other Infectious Diseases	2	49	3	51	1	
II.—General Diseases not Mentioned Above						
43. Cancer or other malignant Tumours of the Buccal Cavity ...	2	32	13	34	3	
44. Cancer or other malignant Tumours of the Stomach or Liver ...	1	73	50	74	3	
Carried forward ...	1,570	25,863	3,058	27,433	1,863	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	1,570	25,863	3,058	27,433	1,863	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.—(*Continued*)						
45. Cancer or other malignant Tumours of the Peritoneum, Intestines, Rectum ...	2	27	12	29	3	
46. Cancer or other malignant Tumours of the Female Genital Organs	...	14	3	14	1	
47. Cancer or other malignant Tumours of the Breast	1	11	1	12	2	
48. Cancer or other malignant Tumours of the Skin	1	21	3	22	1	
49. Cancer or other malignant Tumours of Organs not Specified ...	4	30	14	34	3	
50. Tumours non-malignant	3	91	2	94	5	
51. Acute Rheumatism ...	2	59	...	61	2	
52. Chronic Rheumatism ...	11	51	...	62	3	
53. Scurvy (including Barlow's Disease) ...	...	...	...	...	...	
54. Pellagra	...	...	...	...	...	
55. Beri-beri	164	1,058	220	1,222	132	
56. Rickets	..	...	...	...	...	
57. Diabetes (not including Insipidus) ...	4	24	5	28	2	
58. Anæmia— ...						
(*a*) Pernicious ...	...	3	1	3	1	
(*b*) Other Anæmias and Chlorosis ...	4	61	6	65	3	
59. Diseases of the Pituitary Body ...	...	...	...	.	...	
60. Diseases of the Thyroid Gland—						
(*a*) Exopthalmic Goitre	...	...	...	...	...	
(*b*) Other diseases of the Thyroid Gland, Myxœdema	...	...	...	...	...	
61. Diseases of the Parathyroid Glands ...	...	...	...	...	...	
62. Diseases of the Thymus	...	...	...	...	...	
63. Diseases of the Suprarenal Glands ...	...	...	...	...	...	
64. Diseases of the Spleen	3	15	2	18	...	
Carried forward ...	1,769	27,330	3,327	29,099	2,021	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1925	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	1,769	27,330	3,327	29,099	2,021	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.—(*Continued*)						
65. Leukæmia—						
(*a*) Leukæmia ...	...	2	1	2	...	
(*b*) Hodgkin's Disease ..	...	4	2	4	...	
66. Alcoholism ...	2	74	...	76	3	
67. Chronic poisoning by mineral substances (lead, mercury, etc.)	...	1	1	1	...	
68. Chronic poisoning by organic substances (Morphia, Cocaine, etc.)	34	1,059	3	1,093 (*b*)	8	(*b*) Including Opium addiction
69. Other General Diseases—	2	21	2	23	6	
Auto-intoxication ...	...	...	...	...	...	
Purpura Hæmorrhagica	...	1	1	1	...	
Hæmophilia ...	1	...	...	1	...	
Diabetes Insipidus ...	...	...	...	...	...	
Gout	...	6	...	6	1	
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES						
70. Encephalitis (not including Encephalitis Lethargica) ...	...	2	1	2	...	
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis) ...	...	17	11	17	...	
72. Locomotor Ataxia ...	9	16	3	25	13	
73. Other Affections of the Spinal Cord ...	2	22	4	24	1	
74. Apoplexy—	...	5	5	5	...	
(*a*) Hæmorrhage ...	1	18	16	19	...	
(*b*) Embolism ...	...	1	1	1	...	
(*c*) Thrombosis ...	...	5	1	5	...	
75. Paralysis—						
(*a*) Hemiplegia ...	41	99	12	140	47	
(*b*) Other Paralyses	37	101	16	138	29	
76. General Paralysis of the Insane	...	...	...	...	...	
77. Other forms of Mental Alienation ...	668	755	114	1,423	733	
Carried forward ...	2,566	29,539	3,521	32,105	2,862	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	2,566	29,539	3,521	32,105	2,862	
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.—(*Continued*)						
78. Epilepsy	9	54	3	63	7	
79. Eclampsia, Convulsions (non-puerperal) 5 years or over ...	1	12	11	13	...	
80. Infantile Convulsions	...	22	11	22	1	
81. Chorea	1	1	...	2	...	
82. A.—Hysteria ...	...	7	...	7	1	
B.—Neuritis ...	10	163	1	173	16	
C.—Neurasthenia ...	2	17	...	19	1	
83. Cerebral Softening ...	...	17	9	17	...	
84. Other affections of the Nervous System, such as Paralysis Agitans	5	83	1	88	12	
85. Affections of the Organs of Vision—						
(*a*) Diseases of the Eye ...	29	197	...	226	42	
(*b*) Conjunctivitis ...	20	573	...	593	22	
(*c*) Trachoma ...	1	30	...	31	4	
(*d*) Tumours of the Eye ...	...	1	...	1	...	
(*e*) Other affections of the Eye ...	117	283	1	400	112	
86. Affections of the Ear or Mastoid Sinus ...	7	156	4	163	8	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM						
87. Pericarditis ...	1	16	16	17	...	
88. Acute Endocarditis or Myocarditis ...	2	29	19	31	1	
89. Angina Pectoris ...	1	3	1	4	...	
90. Other Diseases of the Heart—	3	8	6	11	...	
(*a*) Valvular—	6	76	26	82	5	
Mitral ...	7	96	27	103	12	
Aortic ...	8	69	40	77	5	
Tricuspid ...	...	...	...	...	...	
Pulmonary ...	...	1	1	1	...	
(*b*) Myocarditis ...	3	37	10	40	2	
Carried forward ...	2,799	31,490	3,708	34,289	3,113	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES.	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	2,799	31,490	3,708	34.289	3,113	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM.—(*Continued*)						
91. Diseases of the Arteries—						
(*a*) Aneurism ...	...	6	2	6	...	
(*b*) Arterio-Sclerosis	17	53	28	70	5	
(*c*) Other diseases ...	6	16	1	22	...	
92. Embolism or Thrombosis (non-cerebral) ...	...	6	...	6	...	
93. Diseases of the Veins—						
Hæmorrhoids ...	4	127	...	131	6	
Varicose Veins ...	2	9	...	11	1	
Phlebitis	...	3	...	3	...	
94. Diseases of the Lymphatic System—						
Lymphangitis	1	9	...	10	...	
Lymphadenitis, Bubo (non-specific) ...	23	185	...	208	18	
95. Hæmorrhage of undetermined cause ...	1	2	...	3	...	
96. Other affections of the Circulatory System ...	1	13	10	14	...	
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM						
97. Diseases of the Nasal Passages—	...	4	...	4	...	
Adenoids ...	...	27	...	27	...	
Polypus ...	1	14	...	15	1	
Rhinitis ...	...	1	...	1	...	
Coryza ...	6	76	...	82	1	
Other diseases ...	1	51	...	52	1	
98. Affections of the Larynx—						
Laryngitis ...	...	14	...	14	1	
99. Bronchitis—						
(*a*) Acute ...	20	1,274	7	1,294	25	
(*b*) Chronic ...	21	450	9	471	38	
100. Broncho-Pneumonia ...	9	467	267	476	12	
101. Pneumonia—						
(*a*) Lobar ...	30	925	476	955	21	
(*b*) Unclassified ...	2	46	14	48	2	
Carried forward ..	2,944	35.268	4,532	38,212	3,245	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	2,944	35,268	4,532	38,212	3,245	
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM—(*Continued*)						
102. Pleurisy, Empyema ...	7	154	26	161	5	
103. Congestion of the Lungs	...	21	2	21	...	
104. Gangrene of the Lungs	...	5	4	5	...	
105. Asthma	14	346	3	360	22	
106. Pulmonary Emphysema	...	4	...	4	1	
107. Other affections of the Lungs—	...	4	...	4	...	
Pulmonary Spirochætosis ...	...		...	...	...	
VI.—DISEASES OF THE DIGESTIVE SYSTEM						
108. A.—Diseases of Teeth or Gums—	...	13	...	13	..	
Caries, Pyorrhœ, etc. ...	2	96	1	98	...	
B.—Other affections of the Mouth—						
Stomatitis ...	...	32	...	32	1	
Glossitis, etc. ...	...	13	2	13	...	
109. Affections of the Pharynx or Tonsils—	...	1	1	1	...	
Tonsilitis ...	2	173	1	175	3	
Pharyngitis ...	...	66	...	66	3	
110. Affections of the Œsophagus	1	2	...	3	...	
111. A.—Ulcer of the Stomach ...	3	79	24	82	5	
B.—Ulcer of the Duodenum ...	3	22	6	25	...	
112. Other affections of the Stomach—						
Gastritis	9	248	1	257	13	
Dyspepsia, etc. ...	4	152	...	156	3	
113. Diarrhœa and Enteritis—						
Under two years ...	5	258	39	263	2	
114. Diarrhœa and Enteritis—						
Two years and over	9	620	43	629	18	
Colitis	3	291	9	204	5	
Ulceration ...	1	36	6	37	...	
114A. Sprue	...	4	...	4	...	
Carried forward ...	3,007	37,818	4,700	40,825	3,326	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,007	37,818	4,700	40,825	3,326	
VI.—DISEASES OF THE DIGESTIVE SYSTEM.—(*Continued*)						
115. Ankylostomiasis ...	143	3,844	140	3,987	134	
116. Diseases due to Intestinal Parasites—	3	31	...	34	...	
(*a*) Cestoda (Tænia)	2	2	...	4	...	
(*b*) Trematoda (Flukes) ...	...	...	...	...	...	
(*c*) Nematoda (other than Ankylostoma)—						
Ascaris ...	29	612	...	641	14	
Trichocephalus dispar ...	...	...	...	...	...	
Trichina ...	...	2	...	2	...	
Dracunculus	...	6	...	6	1	
Strongylus ...	...	...	...	...	...	
Oxyuris ...	...	...	...	...	...	
(*d*) Coccidia ...	...	...	...	...	...	
(*e*) Other parasites ...	...	10	...	10	...	
(*f*) Unclassified ...	...	...	...	...	...	
117. Appendicitis ...	7	194	22	201	11	
118. Hernia	3	203	3	206	10	
119. A.—Affections of the Anus, Fistula, etc.	5	251	1	256	16	
B.—Other affections of the Intestines—	3	19	2	22	...	
Enteroptosis ...	...	...	...	...	...	
Constipation ...	1	212	...	213	3	
120. Acute Yellow Atrophy of the Liver ...	...	...	...	...	...	
121. Hydatid of the Liver ...	...	2	...	2	...	
122. Cirrhosis of the Liver—						
(*a*) Alcoholic ...	1	16	8	17	1	
(*b*) Other forms ...	23	202	78	225	17	
123. Biliary Calculus ...	...	5	...	5	...	
124. Other affections of the Liver—						
Abscess	2	39	10	41	2	
Hepatitis	1	25	3	26	3	
Cholecystitis ...	2	36	18	38	1	
Jaundice	4	11	...	49	1	
Carried forward ..	3,236	43,574	4,895	46,810	3,540	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end fo 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,236	43,574	4,895	46,810	3,540	
VI.—DISEASES OF THE DIGESTIVE SYSTEM.—(*Continued*)						
125. Diseases of the Pancreas	...	1	1	1	...	
126. Peritonitis (of unknown cause)	...	68	63	68	1	
127. Other affections of the Digestive System ...	11	207	9	218	11	
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL)						
128. Acute Nephritis ...	4	312	28	316	15	
129. Chronic Nephritis ...	48	490	185	538	31	
130. A.—Chyluria ...	...	6	...	6	...	
B.—Schistosomiasis ...	...	3	3	3	...	
131. Other affections of the Kidneys—	...	2	2	2	...	
Pyelitis, etc. ...	1	81	25	82	5	
132. Urinary Calculus ...	...	34	1	34	5	
133. Diseases of the Bladder—						
Cystitis	3	68	1	71	1	
134. Diseases of the Urethra—						
(*a*) Stricture ...	5	95	2	100	1	
(*b*) Other ...	3	113	...	116	3	
135. Diseases of the Prostate—						
Hypertrophy ...	...	2	...	2	...	
Prostatitis ...	1	13	...	14	...	
136. Diseases (non-venereal) of the Genital Organs of Man—						
Epididymitis ...	...	49	...	49	2	
Orchitis	2	49	1	51	3	
Hydrocele ...	7	113	...	120	7	
Ulcer of Penis ...	5	94	1	99	5	
137. Cysts or other non-malignant Tumours of the Ovaries ...	...	16	2	16	1	
138. Salpingitis—	...	1	...	1	...	
Abscess of the Pelvis	...	18	1	18	..	
Carried forward ...	3,326	45,409	5,310	48 735	3,631	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,326	45,409	5,310	48,735	3,631	
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL.—(*Contd*)						
139. Uterine Tumours (non-malignant) ...	...	10	...	10	...	
140. Uterine Hæmorrhage (non-puerperal) ...	...	2	...	2	...	
141. A.—Metritis ...	...	7	...	7	...	
B.—Other affections of the Female Genital Organs—	4	50	2	54	4	
Displacements of Uterus ...	1	26	...	27	1	
Amenorrhœa ...	...	6	...	6	...	
Dysmenorrhœa	...	7	...	7	...	
Leucorrhœa ...	...	23	...	23	1	
142. Diseases of the Breast (non-puerperal)—						
Mastitis	...	4	...	4	1	
Abscess of Breast, etc.	...	12	...	12	...	
VIII.—PUERPERAL STATE						
143. Ante-Natal ...	...	133	...	133	1	
144. A.—Normal Labour ..	34	1,114	1	1,148	36	
B. Accidents of Pregnancy—						
(*a*) Abortion ...	1	67	1	68	...	
(*b*) Ectopic Gestation ...	1	10	...	11	...	
(*c*) Other accidents of Pregnancy	...	32	5	32	1	
145. Puerperal Hæmorrhage	...	29	3	29	2	
146. Other accidents of Parturition ...	11	436	17	447	12	
147. Puerperal Septicæmia	...	18	11	18	2	
148. Phlegmasia Dolens ...	...	1	...	1	...	
149. Puerperal Eclampsia ...	1	17	7	18	...	
150. Sequelæ of Labour ...	1	1	1	2	...	
151. Puerperal affections of the Breast ...	...	2	...	2	...	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES						
152. Gangrene ...	3	21	7	24	3	
Carried forward ...	3,383	47,437	5,365	50,820	3,695	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,383	47,437	5,365	50,820	3,695	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES —(*Continued*)						
153. Boil—	1	107	...	108	2	
Carbuncle ...	2	66	...	68	1	
154. Abscess—	28	860	5	888	39	
Whitlow	1	43	...	44	1	
Cellulitis	18	409	30	427	24	
155. A.—Tinea ...	...	15	...	15	1	
B.—Scabies ...	7	516	...	523	17	
156. Other Diseases of the Skin—	6	117	...	123	4	
Erythema ...	5	63	1	68	2	
Urticaria	...	27	...	27	1	
Eczema	6	272	...	278	9	
Herpes	...	24	...	24	...	
Psoriasis	...	5	...	5	1	
Elephantiasis ...	...	19	...	19	1	
Myiasis	...	...	...	...	...	
Chigoes ...	...	...	...	...	...	
Cutaneous Leishmaniasis ...	...	7	...	7	...	
Ulcers	247	4,247	...	4,494	294	
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS)						
157. Diseases of Bones— Osteitis	3	17	...	20	4	
158. Diseases of Joints – Arthritis	13	343	1	356	28	
Synovitis	1	37	...	38	2	
159. Other Diseases of Bones or Organs of Locomotion	18	226	4	244	21	
XI.—MALFORMATIONS						
160. Malformations— Hydrocephalus ...	...	8	1	8	...	
Hypospadias ...	...	...	...	...	...	
Spina, Bifida, Hare-lip, etc. ...	1	21	1	22	1	
Carried forward ...	3,740	54,886	5,408	58,626	4,148	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,740	54,886	5,408	58,626	4,148	
XII.—DISEASES OF INFANCY						
161. Congenital Debility ...	...	13	8	13	...	
162. Premature Birth ...	...	8	8	8	...	
163. Other affections of Infancy	...	12	9	12	..	
164. Infant neglect (infants of three months or over)	...	...	...	...	...	
XIII.—AFFECTIONS OF OLD AGE						
165. Senility—	5	127	60	132	36	
Senile Dementia ...	...	...	...	...	...	
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES						
166. Suicide by Poisoning ...	...	...	...	...	...	
167. Corrosive Poisoning (intentional) ...	...	...	...	...	...	
168. Suicide by Gas Poisoning	...	...	..	...	...	
169. Suicide by Hanging or Strangulation ...	...	2	2	2	...	
170. Suicide by Drowning ...	...	2	...	2	1	
171. Suicide by Firearms ...	...	...	...	...	...	
172. Suicide by cutting or stabbing Instruments	...	2	1	2	...	
173. Suicide by jumping from a height ...	...	...	...	...	...	
174. Suicide by crushing ...	...	...	...	...	...	
175. Other Suicides ...	...	4	...	4	...	
176. Food Poisoning—	...	2	...	2	...	
Botulism, etc. ...	...	6	...	6	...	
177. Attacks of poisonous animals—						
Snake bite ...	...	11	...	11	...	
Insect bite ...	...	7	...	7	...	
178. Other accidental Poisonings ...	2	37	8	39	...	
179. Other Intentional Poisonings ...	...	2	...	2	...	
180. Burns (by Fire) ...	7	107	18	114	2	
181. Burns (other than by Fire)	6	111	4	117	4	
182. Suffocation (accidental)	...	1	...	1	...	
183. Poisoning by Gas (accidental)	...	...	...	...	...	
184. Drowning (accidental)	...	1	...	1	...	
Carried forward ...	3,760	55,341	5,526	59,101	4,191	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,760	55,341	5,526	59,101	4,191	
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.—(*Continued*)						
185. Wounds (by Firearms, war excepted) ...	5	42	11	47	2	
186. Wounds (by cutting or stabbing Instruments)	23	688	17	711	32	
187. Wounds (by Fall) ...	24	998	11	1,022	27	
188. Wounds (in Mines or Quarries) ...	1	24	...	25	...	
189. Wounds (by Machinery)	2	178	1	180	12	
190. Wounds (crushing, *e.g.* Motor car, railway accidents, etc.) ...	6	646	12	652	26	
191. Injuries inflicted by Animals, Bites, Kicks, etc.	...	31	...	31	2	
192. Wounds inflicted on Active Service ...	...	...	...	...	...	
193. Executions of civilians by belligerents ...	...	...	...	...	...	
194. A.—Over fatigue ...	...	...	...	...	...	
B.—Hunger or Thirst	...	3	...	3	...	
195. Exposure to Cold, Frost bite, etc. ...	...	13	...	13	...	
196. Exposure to Heat—						
Heatstroke ...	...	...	...	...	...	
Sunstroke ...	...	2	1	2	...	
197. Lightning Stroke ...	...	...	...	...	...	
198. Electric Shock ...	...	3	1	3	...	
199. Murder by Firearms ...	...	...	...	...	...	
200. Murder by cutting or stabbing Instruments	...	6	6	6	...	
201. Murder by other means	...	...	...	...	...	
202. Infanticide (Murder of an infant under one year)	...	...	...	...	...	
203. A.—Dislocation ...	...	44	1	44	1	
B.—Sprain ...	6	103	...	109	2	
C.—Fracture ...	49	641	90	690	46	
204. Other external injuries	14	861	1	881	16	
205. Deaths by Violence of unknown cause ...	...	...	...	...	...	
Carried forward ...	3,890	59,630	5,678	63,520	4,357	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1926	REMARKS
		Admissions	Deaths			
Brought forward ...	3,890	59,630	5,678	63,520	4,357	
XV.—ILL-DEFINED DISEASES						
206. Sudden Death (cause unknown) ...	...	...	...	...	...	
207. A.—Diseases not already specified or ill-defined—	13	847	34	860	30	
Ascites ...	...	8	...	8	...	
Œdema ...	..	4	...	4	...	
Asthenia, Marasmus, etc.	5	106	16	111	...	
Shock ...	...	4	3	4	...	
Hyperpyrexia ...	...	40	1	40	1	
Pyrexia of uncertain Origin	8	761	1	769	18	
B.—Malingering ...	...	12	...	12	...	
C.—Opium Addiction	34	1,544	...	1,578	14	
XVI.—Diseases, the total of which have not caused 10 deaths	18	1,020	...	1,038	21	
Accompanying Child ...	...	70	...	70	...	
Total ...	3,968	64,046	5,733	68,014	4,441	

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